STEEL

PRODUCTION

PROCESSING

DISTRIBUTION

USE

EDITORIAL STAFF
E. L. SHANER
Editor

ASSOCIATE EDITORS
E. C. BARRINGER — E. F. ROSS
A. J. HAIN — J. D. KNOX
G. H. MANLOVE — A. H. ALLEN
E. A. FRANCE JR. — GUY HUBBARD

New York
E. C. KREUTZBERG — B. K. PRICE
L. E. BROWNE

Pittsburgh
W. G. GUDE

Chicago
F. B. PLETCHER

Washington
L. M. LAMM

London
VINCENT DELPORT

BUSINESS STAFF
GEORGE O. HAYS
Business Manager

New York
E. C. KREUTZBERG — E. W. KREUTZBERG

Pittsburgh
S. H. JASPER

Chicago
L. C. PELOTT — C. A. WARDLEY

Cleveland
JOHN HENRY — R. C. JAENKE

CONTENTS

April 4, 1932

THE WEEK IN STEEL 15

Taylor-Irwin-Filbert Triumvirate for U. S. Steel 17
Ban on Soviet Manganese Asked Again 19
March Pig Iron Output Lowest of Present Depression 20
Industrial Men in the Day's News 21
Obituary 22
Here and There in Industry 23
Mirrors of Motordom 24

EDITORIAL—It's Time To Curb Deflationary Buying 26
THE BUSINESS TREND 27

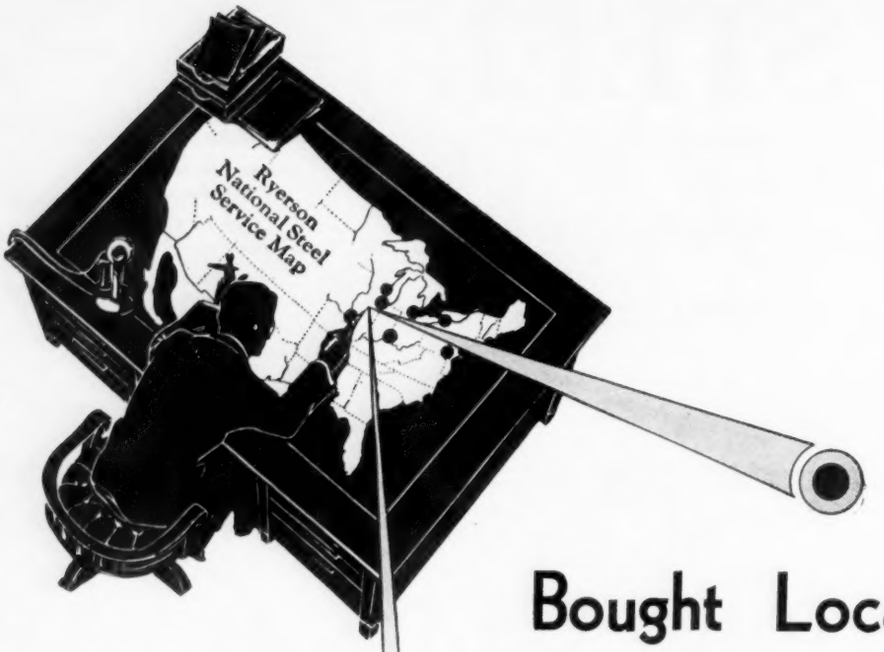
International Exposition Buildings of Low-Cost Construction 31
Foundrymen Arrange Program for Detroit Convention 35
Three-M Congress Scheduled with Foundry Convention 36
Chrome-Nickel Steel Trim Has Concrete Backing 38
Soldered Joints in 18-8 Steel Require Strengthening 40
New Books Worth Reading 42
Steel Milk Truck Tank Withstands Bombing 43
Making the Most of Steel 45
Scanning the Technology of Steel 46
Large Uses of Steel in Small Ways—Miniature Trains 48
Progress in Steelmaking 49
New Equipment 51

MARKET REPORTS AND PRICES 57-74
CONSTRUCTION AND ENTERPRISE 76
NEW TRADE PUBLICATIONS 76
WHERE-TO-BUY DEPARTMENT 77
ADVERTISERS' INDEX 95

STEEL is published every Monday by PENTON PUBLISHING CO., Penton Building, Cleveland, O. C. J. STARK, President; J. D. PEASE, Vice President; F. V. COLE, Secretary. Member, Audit Bureau of Circulations; Associated Business Papers Inc., and National Publishers Association. Branch Offices: New York, 220 Broadway; Chicago, Peoples Gas building; Pittsburgh, Oliver building; San Francisco, Alto building; Washington, National Press building; Cincinnati, Schmidt building; London, Caxton House, Westminster, S. W. 1; Berlin, Lichterfeld-West, Dahlmerstrasse 64a, Germany. Subscription in the United States, Cuba and Mexico $6 per year; in Canada $8.60; in Great Britain and European countries £2:8s.

Entered as second class matter at post office at Cleveland under the Act of March 3, 1879.

Copyright 1932 by the Penton Publishing Co.



Bought Locally—
F.O.B. 1000 Miles Away

What do you do when you buy for branches or distant jobs? Is it necessary to negotiate with some unknown source? Or can you call in your regular source and get the same service for the distant city as at the home plant?

In the case of steel you can buy locally and the order is shipped from the Ryerson Steel-Service Plant nearest the point of destination, at a very definite saving in time and money.

And what is often more important, you can absolutely depend upon the Ryerson Organization to deliver.

Ten Ryerson Plants

Make it easy to buy for distant points. Combine your orders and save time, trouble and money.

—— CHICAGO ——
— MILWAUKEE —
—— ST. LOUIS ——
— CINCINNATI —
—— DETROIT ——
— CLEVELAND —
—— BUFFALO ——
—— BOSTON ——
— PHILADELPHIA —
— JERSEY CITY —

Bars	Refined Iron	Babbitt Metal
Structurals	Screw Stock	Allegheny Metal
Rails	Strip Steel	Alloy Steel
Plates	Rivets and Bolts	Tool Steel
Sheets, Blk. and Galv.	Boiler Tubes and Fittings	Concrete Reinforcing
Sheets, Full Finished	Welding Rod	Firmtread Plates
Turned, Ground and Polished Shafting	Forging Bars	Small Tools
		Machinery, etc.

Joseph T. Ryerson & Son, Inc., Chicago, Milwaukee, St. Louis, Cincinnati, Detroit, Cleveland, Buffalo, Boston, Philadelphia, Jersey City

RYERSON
STEEL-SERVICE

Volume 90 Number 14

STEEL

For forty-eight Years—IRON TRADE REVIEW

PRODUCTION ◆ PROCESSING ◆ DISTRIBUTION ◆ USE

The Week In Steel

THE automobile industry is taking the depression "for a ride." With the Ford eight a reality, the new Plymouth out and Chevrolet reducing prices, the big three of the low-price field are scraping fenders in a spirited race for the consumer's dollar. His announcement the sensation of the day and the trend of business hinging on his $500 car, Mr. Ford unquestionably ascends the pinnacle of his extraordinary career. In the manufacture of the new Fords (page 24) castings and aluminum score noteworthy gains, carbon steel holds its own, rustless steel loses some ground. And not content with offering the greatest values in history, automobile manufacturers are merchandising them, the General Motors show in 55 cities (page 25) being a pretentious effort.

Auto Industry Would Re-live 1921

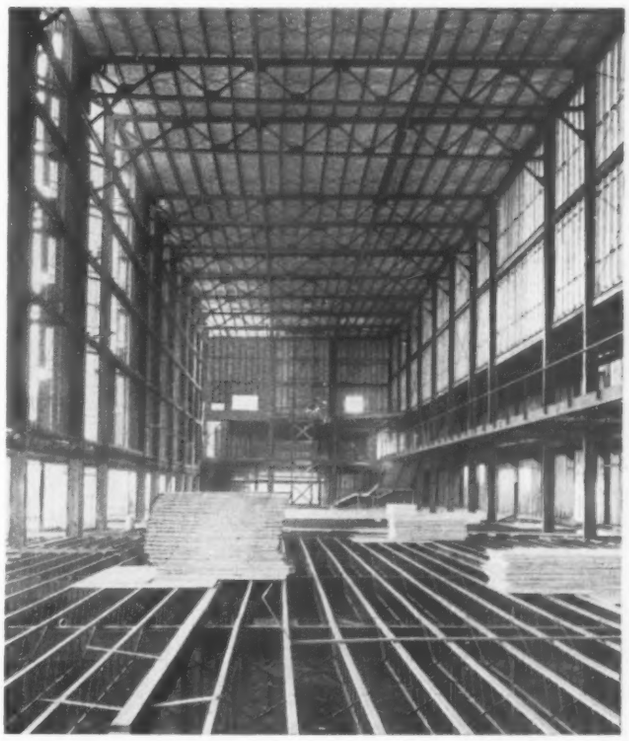
In 1921 the automobile industry led America out of depression by making it automobile-conscious; in 1932 it is attempting to repeat, but by replacing old cars with new. To this aggressiveness steelmakers look for a noteworthy lift in demand (page 57); it is the outstanding hope for improvement in the markets this month.... Railroad requirements continue disappointing, illuminated only by the New Haven order for 10,000 tons of rails (page 61). . . . In fact, the construction of miniature trains requires relatively more steel than their real-life models (page 48), this industry consuming 5300 tons of steel annually. . . . Structural orders, for several weeks a notable prop of the market (page 62), have eased off.

Steel Rate Holds; Pig Iron Gives

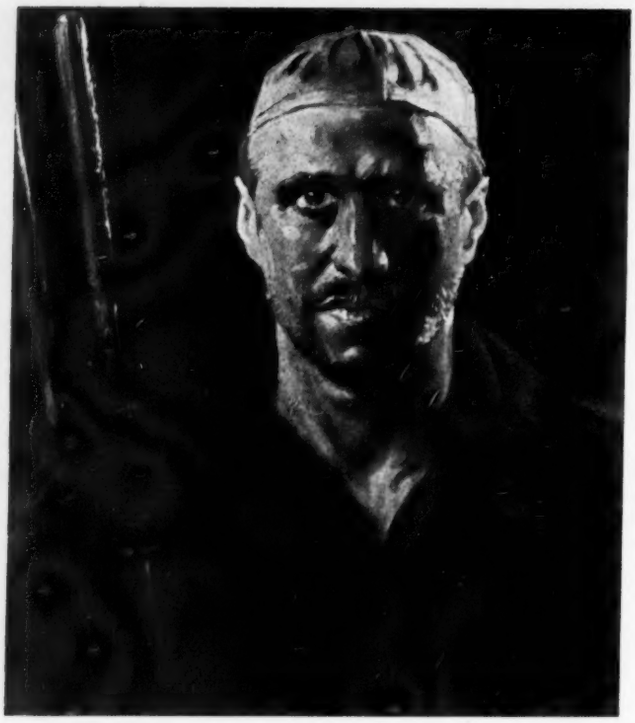
At 23 per cent, steelworks operations appear to have hit a secondary bottom (page 65), maintenance of this rate for the past two weeks and probability of a slight rise this week heartening the industry. . . . Little cheer, however, can be adduced from the report pig iron production turns in for March (page 20). Daily output at 30,919 gross tons represents a decline of 6.6 per cent from the February rate, is the lowest of the depression. And on March 31 only 60 of the country's 298 potential stacks were active. . . . Final statistics of the American Iron and Steel institute for 1931 place total pig iron output at 17,957,779 tons (page 20), a shrinkage of 42 per cent from 1930.

Read Blackstone, Not Tiemann

The law and not the mill appears to be the approach to power in the United States Steel Corp. In the seat of authority—chairman of the board—which Judge Gary occupied for almost three decades, another lawyer-executive,



Hall of Science, like many other buildings erected for Chicago's Century of Progress exposition, has a framework of steel—2709 tons. The floor area is 408,400 square feet



"Constructive Radical," a steelworker's portrait painted by Garrit A. Beneker, exhibited at Museum of Science and Industry, New York. Though radical, the steelworker will "listen to reason," is the artist's opinion

Myron C. Taylor, now sits (page 17). With the retirement of President Farrell in two weeks the triumvirate of Taylor-Morgan-Farrell is succeeded by Taylor-Irvin-Filbert.

Still "See Red" on Russian Manganese

There is a strong international flavor to business news this week. . . .Having failed to obtain a dumping order on Russian manganese, domestic producers are importuning the treasury (page 18) to bar it on the ground forced labor produces it. . . . Soviet Russia having only rubles to exchange for services (page 19), a Detroit firm of engineers withdraws its cooperation from the 5-year plan. . . . When he set up a new classification for galvanized wire netting and raised the duty the President overstepped his authority (page 18), the New York customs court has ruled. . . . Depreciated foreign currencies have stimulated imports of steel less than of other products (page 17) because most foreign steel sources still are "on gold."

Chicago's "I Will" Survives

Undaunted by the depression, Chicago is carrying on with ambitious plans for her Century of Progress exposition in 1933, and buildings already erected or almost completed account for 8200 tons of structural steel (page 31). Radical design characterizes practically all of the exposition buildings, which must be razed when the gates close. . . . At this exposition the United States Steel Corp. has decided (page 18) to exhibit its products and services. . . . Chicago manufacturers of farm implements are betting a 10 per cent reduction in their prices against general recovery in the fall (page 19) by offering to barter their products now for wheat, cotton and corn later.

Color and Cost Vanquish Bright Radiator

Chrome-nickel steel surrendered its largest individual outlet in the automobile industry when Ford bowed to color and cost in designing his new radiator shell, but the aggregate of smaller parts in the new Fords almost requites this loss (page 24). A strip down the center of the hood conceals and waterproofs the hinge; another strip, wrapped around a core of carbon steel, forms the spanner bar. . . . For a new use of this steel in the building industry, sheets are formed to shape, placed in a mold, anchors are welded to the reverse side and a light weight concrete backing aggregate is applied (page 38). Cured, this metal and concrete unit is installed like ordinary masonry.

Win D. S. C. in Milk War

Both chrome-nickel steel and welding scored a victory when, during a milk price war in a southern city, a 2000-gallon truck tank was bombed (page 43). Although the impact occurred at a welded seam, only a bulge resulted. . . . . When joints in corrosion-resistant steel are soldered the solder should be regarded only as a seal (page 40) and the joint otherwise strengthened. . . . Long life is derived from spinning tools made of chrome-nickel cast iron (page 45) heat-treated to maximum hardness. . . . Stainless steel cutlery has been found (page 45) no more affected by heat or cold or sunlight or darkness than carbon steel. . . . For the rear brake drum on the new Fords a special chrome-nickel gray iron casting is used (page 24).

Foundrymen at Detroit, May 2-5

This trend toward alloys in all forms of castings will be discussed when the American Foundrymen's association stages its annual convention at Detroit, May 2-5. The program (page 35), provides a complete series of technical sessions, round tables and shop courses. Several concurrent conventions will mesh in with the foundry program. . . . At a convention last week steel mill engineers were told (page 36) that with a new type of wet cleaner installed in the gas main system, blast furnace stove and gas engine efficiency is greatly increased.

Taylor-Irvin-Filbert Form Triumvirate for U. S. Steel

NEW YORK—Induction of William A. Irvin, primarily a production man, into the presidency of the United States Steel Corp., April 19, is expected to draw a clearer line between production and sales activity of the Corporation.

During the many years of James A. Farrell's tenure as president, the Corporation underwent a notable expansion, from which many duties in both sales and production accrued to Mr. Farrell.

A trend toward distributing these burdens, and particularly to center more individual attention on the problems of distribution, was seen in the appointment two years ago of E. P. Thomas as vice president in charge of sales. It is now believed that the scope of Mr. Thomas will be broadened and that in sales he will complement Mr. Irvin in production.

Liken Taylor To Gary

At the directors' meeting March 29, Myron C. Taylor, who became chairman of the finance committee following the death of Judge Gary, late in 1927, was made chairman of the board. He succeeds J. P. Morgan, admittedly an interim appointee. It is observed that Mr. Taylor, like Judge Gary, was trained in the law.

The triumvirate formed by Messrs. Taylor, Morgan and Farrell late in 1927 thus is succeeded by one composed of Messrs. Taylor, Irvin and William J. Filbert, formerly comptroller and recently elevated to vice chairman of the finance committee.

Eventually, it is believed in some quarters, Mr. Filbert will become chairman of the finance committee, but this move does not appear imminent and it is recalled that Judge Gary held both posts a number of years.

Farrell Honored April 21

In his new capacity, with duties similar to those formerly exercised by the late Judge Gary, as precisely stated in the official announcement, Mr. Taylor will assume charge of all matters of finance and general policy.

Honoring Mr. Farrell, the American Iron and Steel institute will tender a testimonial dinner at the Waldorf-Astoria hotel, April 21. Mr. Farrell is a vice president of the institute. Arrangements probably will be made this week on the return of Mr. Filbert to New York, and invitations will be issued soon.

Next Oct. 15, it has been announced, the Myron Taylor hall of the 'ornell Law School at Ithaca, N. Y.. will be dedicated. A gift of $1,500,000 from Mr. Taylor made possible this structure.

A. O. Smith Sale to Steel Corporation Is Rumored

New York—While officials of the A. O. Smith Corp., Milwaukee, manufacturer of automobile frames, welded steel pipe and other steel products, deny that negotiations are on for its sale to the United States Steel Corp., officials of the latter will make no comment.

The A. O. Smith Corp. was organized in 1916 as the successor to the A. O. Smith Co., formed in 1904. Its process for welding pipe may be said to have almost revolutionized the steel pipe industry. Its process for automatically fabricating automobile frames has won wide attention.

Fail To Sell Belfont Steel

Ironton, O.—Inasmuch as there were no bidders for the defunct Belfont Steel & Wire Co., Ironton, O., when it was offered for public sale March 30 by government order, a reappraisement will be ordered. The company was formerly a $2,000,000 concern, but was put up by United States marshal for $59,300.

Dissolve Gears & Forgings

Cleveland—Gears & Forgings Inc., Cleveland, has been placed in the hands of dissolving receivers, following suit in federal court here recently by Republic Steel Corp., Youngstown, O., representing claims amounting to approximately $18,000.

Receivers appointed are: S. C. Dalbey, the concern's secretary and treasurer, and Attorney F. L. Leckie. Orders for material which the company had outstanding have in several cases been cancelled, inasmuch as the concern will be dissolved. Gears & Forgings was formed in 1928 through the merger of Van Dorn & Dutton Co and Ohio Forge Co, both of Cleveland; William Fawcus Machine Co., Ford City, Pa., and William Ganschow Co., Chicago.

Closes Monaca Plant

Pittsburgh—Vanadium Alloys Steel Co. is combining its business with that of the Colonial Steel Co., a subsidiary. Operations will be centralized at Latrobe, Pa., and the Colonial plant at Monaca, Pa., closed indefinitely.

"Gold" Nations Ship Steel

New York—Since most foreign competition in iron and steel comes from France, Belgium and Germany, still on the gold standard, the import situa-

MYRON C. TAYLOR

BORN Jan. 18, 1874, in Lyons, N. Y. Graduated in law, Cornell university, 1894. Became interested in large textile enterprises. As protege of the late George F. Baker, chairman, First National bank, rose rapidly in New York banking community. Director, First National bank; director, New York Central and Santa Fe railroads; trustee, Mutual Life Insurance Co. Elected chairman United States Steel Corp.'s finance committee Dec. 27, 1927; elected chairman, board of directors, March 29, 1932

tion in iron and steel, while serious, has not been particularly aggravated by depreciated foreign currencies. The most important foreign nation off the gold standard is Sweden. Some American steel producers, however, are associated with a movement to adjust foreign duties in relation to depreciated currency.

Service Tests on Autos Supplement Laboratories

Detroit—"Service Testing of Automotive Products and Correlation with Laboratory Tests" was the subject of a joint district meeting of the American Society for Testing Materials, Society of Automotive Engineers, and American Society for Steel Treating here, March 28. Dr. F. O. Clements, technical director, General Motors Corp., research laboratories, presided, and in his introductory remarks stressed the necessity of harmonizing laboratory and service tests.

J. M. Watson, metallurgical engineer, Hupp Motor Car Corp., emphasized the necessity for reducing weight, consistent with service, in view of the increasing tendency of many states to levy taxes on the basis of weight.

A. J. Schamehorn, director of the General Motors Corp. proving ground, reported 163 separate tests are now made at the proving ground, where an average mileage of 7,000,000 is run up annually in testing automobiles.

A paper by J. L. McCloud, metallurgist, Ford Motor Co., read by E. W. Upham, chief metallurgist, Chrysler Corp., cited some instances where materials standing up in laboratory tests failed in service.

Owners of high-price cars, usually being graduates of the low-price field and being educated by sales forces to expect near-perfection, afford more reactions than laboratories, declared Nicholas Dreystadt, general service manager, Cadillac Motor Car Co.

Will Exhibit at Fair

An exhibit of the steel industry will be maintained at the Chicago century of progress exposition, 1933, by the United States Steel Corp. This exhibit, the 117th arranged by industries, will be located in the mineral industries pavilion of the general exhibits group.

Ban on Soviet Manganese Asked Again; Resume Hearings on Coal Control Bill

PROHIBITION of imports of manganese ore from Soviet Russia on the ground it is produced by forced and convict labor is asked of the treasury department by J. Carson Adkerson, president, American Manganese Producers' association. Affidavits to prove that forced labor is used were submitted by Mr. Adkerson. Says Mr. Adkerson in his communication to the treasury:

"The American manganese industry has now a productive capacity amply capable of supplying the present domestic consumptive demands. It is recognized that the present consumptive demand for manganaese in the United States is momentarily subnormal. There is now question, however, that the capacity to produce manganese in this country can be readily increased to meet the larger consumptive demands of the nation as industry returns to normal."

□ □ □

Hearings will be resumed April 5 by the senate committee on mines and mining on the bill of Senator Davis, of Pennsylvania, "to regulate interstate and foreign commerce in bituminous coal; provide for consolidations, mergers, and co-operative marketing; require the licensing of corporations producing and shipping coal in interstate commerce; and to create a Bituminous Coal commission; and for other purposes."

This bill would provide for regulation of the bituminous industry in much the way the interstate commerce commission regulates the railroads. Many believe a commission would increase the price of coal, but this is denied by its proponents. Senator Davis is hopeful he will get favorable action at this session of congress.

Representative Kelly, of Pennsylvania, has introduced an identical bill in the house but he stated to STEEL that he did not intend to ask for any hearings because he wishes to wait until action is taken by the senate and then put it through the house. He also is hopeful of getting action at this session. The general belief is, however, that no action will be taken at this time.

□ □ □

In the tax bill which the house is now ready to transmit to the senate, the steel industry escapes direct levies. Efforts to put an import tax on manganese ore and fluorspar were killed.

A duty of 1 cent a pound on the metallic content of ore in excess of 10 per cent and an import tax of 1⅞ cents per pound on the metallic manganese content of imported manganese silicon, ferromanganese and spiegeleisen would have netted the treasury $6,250,000 a year and increased the cost of producing steel only 16 cents a ton, its sponsors claimed.

On fluorspar the effort was to make the duty $3 per ton on the content in excess of 50 per cent.

□ □ □

Strip steel for safety razor blades, edges of which have been filed after the shearing process to remove the burr left by the shearing, is not subject to the additional duty of 2/10c per pound provided in paragraph 315 of the Tariff act, the customs bureau has ruled.

Safety Council Offers Help to Nonmembers

Safety work of several thousand industrial members of the National Safety council, Chicago, has been analyzed, and the most effective technique will be made available to any plant desiring a specific course of safety procedure, without cost. The sole obligation on the employer's part will be to provide a few essential facts from which the council engineers can draw up a practical working plan commensurate with the company's needs and applicable to specific operating problems. The council states it is ready to help such companies regardless of membership.

Limits Flexible Tariff

New York—While the President may raise or lower duties 50 per cent under flexible provisions of the tariff act, he may not set up new classifications, according to an opinion of the United States customs court here.

Sears, Roebuck & Co, Chicago, protested successfully the procedure whereby as of Feb. 5, 1931, the President had increased the duty on galvanized wire netting.

Sheet Sellers To Meet

National Association of Sheet Metal Distributors will hold its 21st annual meeting at the Bellevue-Stratford hotel, Philadelphia, May 11-12.

To Need Fewer Freight Cars

Pittsburgh — Allegheny regional board shippers estimate their second quarter freight car requirements at 605,558 units, 7.8 per cent below the number actually used in the second

quarter of 1931. Estimated reductions this quarter include 7.9 per cent in iron and steel, 6.4 per cent in coal and coke, 43 per cent in machinery and boilers and 19.9 per cent in automobiles and parts.

Separate on Rubles

Detroit—Albert Kahn Inc., engineers and architects, since 1929 assisting in the 5-year plan of Soviet Russia, has broken with the soviet government on the matter of payment The soviet government informed the Kahn organization it would be able to pay only in rubles, not now of value outside of Russia, and an agreement to part company amicably followed.

Equals 10 Per Cent Cut

Chicago—Willingness of the International Harvester Co. to accept payment for farm equipment in wheat at a premium of 18 cents a bushel, corn at 17 cents and cotton 2 cents indicates a reduction of about 10 per cent in implement prices or is a mark of confidence that prices will have strengthened by fall. Other implement manufacturers are following suit.

Sees Some Value In Antitrust Laws

WASHINGTON — That business men are opposed to the antitrust laws is a popular fallacy, Charles F. Abbott, executive director, American Institute of Steel Construction, told the Hastings subcommittee conducting hearings on the Nye bills to amend the federal trade commission act, March 31.

"More enlightened executives," he said, "are convinced that the Sherman and Clayton acts have been of inestimable value to business development. The federal statutes, in their basic intents, have done much toward classifying and restraining the frictions in business.

"But there has grown up in this country a system of law enforcement which leaves the statutes at the mercy of the prejudices and policies of individuals who happen to be holding political office. The law prohibits restraints of trade, yet frequently this is interpreted not to have any validity against a corporation that may adopt trading methods calculated to drive a competitor into bankruptcy.

"We feel that if congress will give legal status to trade agreements which are not in contravention of the Sherman, Clayton or the federal trade acts a very constructive move will have been initiated."

Statisticians To Meet

Factors for recovery of business will be appraised at a meeting of the Ohio Group of Statisticians co-operating with the Cleveland Statistical club and the Social Science Section of the Ohio Colleges, at the Hotel Cleveland, Cleveland, April 8-9.

Joist Standard Effective

Washington — Enough acceptances have been received to the standard for forms for concrete joist construction floors to make this standard effective May 1 for one year.

Lupton Sons Co. Bankrupt

Philadelphia—David Lupton Sons Co., long-established sheet metal worker, has gone into voluntary bankruptcy.

Army's New Hush-Hush Plane Built Largely of Sheet Metal

A "SHEET-METAL triumph," is an aviation writer's description of the newest United States army plane, BETA, developed by the Northrop Aircraft Co., Burbank, Calif. The craft, shown at the right, is not for combat purposes; significant in aviation circles, as it indicates that even army observation craft, "hush-hush planes," they are called, soon will be built practically entirely of sheet metal.

The method of fabricating wings and tails is such that the resulting structures are in reality cellular box spars having great torsional stiffness.

Aviation sheet-metal shops, using the various alloys developed for aircraft, never were busier than now. Such well-known builders as Fokker, Lockheed, Ryan and Northrop have added to their sheet-metal personnel through conservative progression. While the number of new planes has been reduced, there has been intensified upkeep and remanufacturing of old ships, in some instances practically remaking them. At the left is a view in one of Fokker's sheet-metal shops.

Pig Iron Output in March Lowest of This Depression

COKE pig iron production in March totaled 2070 tons less than in February, despite the fact that March was a two-day longer month. As a result, the average daily rate dropped to 30,919 tons, the lowest at any time during the present depression. Active blast furnaces which had increased from 61 in January to 64 in February, shrank to 60 on March 31.

Total production in March was 958,480 gross tons which, compared with the 960,550 tons of February, was a loss of 2070 tons, or 0.2 per cent. This was the lowest monthly total since the 954,901 tons of August, 1921, with the all-time low standing as 864,642 tons in July, 1921.

AVERAGE DAILY PRODUCTION

	1932	1931	1930	1929
Jan.	31,336	55,337	91,573	110,742
Feb.	33,122	61,114	101,640	114,942
Mar.	30,919	65,448	104,930	119,662
Apr.	.....	66,986	106,371	122,106
May	.....	64,355	104,564	125,753
June	.....	54,599	97,817	123,837
July	.....	47,170	85,110	122,016
Aug.	.....	41,264	81,455	120,845
Sept.	.....	38,947	75,893	116,548
Oct.	.....	37,831	69,851	115,747
Nov.	.....	36,727	62,182	106,081
Dec.	.....	31,625	53,732	91,513
Av.	31,763	50,035	86,141	115,808

The average daily rate of 30,919 tons in March was 2203 tons, or 6.6 per cent less than the 33,122-ton rate of February and was the lowest since the 30,802 tons of August, 1921. The all-time low was established in July, 1921, with 27,892 tons. The daily rate of February had made the first increase since the present decline started last May.

For the first quarter of this year, production has aggregated 2,890,467 tons, a total which was 2,565,074 tons, or 48 per cent below the 1931 first quarter figure of 5,455,541 tons.

Relating production to capacity, the operating rate of March was 21.4 per cent, compared with 23.0 per cent in February and 21.8 per cent in January.

During the month, 5 furnaces were blown in and 9 were blown out or banked, the net loss being 4 units. Of the merchant class, 1 was blown in and 5 were blown out, with a decrease of 4 for this class. Of the nonmerchant or steelworks class, 4 were blown in and 4 removed from blast.

Furnaces returning to operation in March were: In Ohio: Hamilton, Hamilton Coke & Iron Co.; Massillon, Republic Steel Corp. In Pennsylvania: Farrel No. 2, Carnegie Steel Co.; Bethlehem G, Bethlehem Steel Co. In Alabama; Woodward No. 1, Woodward Iron Co.

Stacks blowing out or banking were: In Ohio: Hubbard No. 2, Youngstown Sheet & Tube Co. In Pennsylvania: Shenango No. 3, Shenango Furnace Co.; Monongahela No. 2, National Tube Co.; Bethlehem D, Bethlehem Steel Co. In New York: Standish, Chateaugay Ore & Iron Co. In Alabama: Woodward No. 2, Woodward Iron Co.; one Pioneer, Republic Steel Corp.; Ensley No. 3, Tennessee Coal, Iron & Railroad Co. In Illinois: Joliet No. 4, Illinois Steel Co.

MONTHLY PRODUCTION

	1932	1931	1930
Jan.	971,437	1,715,443	2,838,751
Feb.	960,550	1,711,192	2,845,937
Mar.	958,480	2,028,906	3,252,822
April	.....	2,009,582	3,191,119
May	.....	1,995,001	3,241,477
June	.....	1,637,998	2,934,508
July	.....	1,462,270	2,638,441
Aug.	.....	1,279,205	2,525,105
Sept.	.....	1,168,436	2,276,781
Oct.	.....	1,172,781	2,165,374
Nov.	.....	1,101,820	1,865,458
Dec.	.....	980,377	1,665,715
Total	2,565,074	18,263,011	31,441,488

Institute Gives Final 1931 Pig Iron Totals

New York—American Iron and Steel institute reports 1931 production of pig iron at 17,957,779 gross tons, a decrease of 42.11 per cent from 1930.

Ferroalloy production was 468,575 tons, a decrease of 35.92 per cent.

Pennsylvania was the leading producer of iron with 5,037,672 tons, a decrease of 49.46 per cent; also of ferroalloys with 195,552 tons, a decrease of 42.02 per cent.

Basic iron production was 10,174,447 tons, a decrease of 44.68 per cent. Bessemer and low phosphorus iron output was 4,635,648 tons, a decrease of 36.63 per cent.

Foundry iron total was 2,133,939 tons, a decrease of 41.10 per cent. Malleable iron production was 945,664 tons, a decrease of 39.80 per cent. Forge iron aggregate was 36,482 tons, a decrease of 28.04 per cent. All other iron totaled 31,599 tons, a decrease of 53.38 per cent.

Ferromanganese and spiegeleisen output was 234,808 tons, a decrease of 35.20 per cent. Ferrosilicon totaled 211,284 tons, a decrease of 37.42 per cent. All other alloys were 22,483 tons, a decrease of 28.02 per cent.

RATE OF OPERATION
(Relation of Production to Capacity)

	1932[1]	1931[1]	1930[2]	1929[3]
January	21.8	38.4	65.0	79.0
February	23.0	42.5	72.1	82.2
March	21.4	45.4	74.5	85.5
April	.....	46.5	75.4	87.4
May	.....	44.7	74.2	89.8
June	.....	37.9	69.3	88.5
July	.....	32.7	60.3	87.2
August	.....	28.7	57.8	86.4
September	.....	27.0	53.8	83.3
October	.....	26.3	49.6	82.6
November	.....	25.5	44.1	75.8
December	.....	22.0	38.1	65.5

[1]Based on capacity of 52,515,875 tons Dec. 31, 1930; [2]on capacity of 51,490,680 tons; [3]on capacity of 51,069,895 tons. Capacities by American Iron and Steel institute.

MARCH IRON PRODUCTION

	No. in blast last day of month Mar.	Feb.	Total tonnage made Merchant	Nonmerchant
Ohio	16	15	13,936	225,269
Pennsylvania	16	17	39,673*	208,230
Alabama	4	6	34,877	33,504
Illinois	6	7	51,590	55,342
New York	5	6	57,718	27,954
Colorado	1	1		
Indiana	5	5		
Maryland	2	2	75	144,597
Virginia	0	0		
Wisconsin	0	0		
Kentucky	1	1		
Massachusetts	0	0		
Tennessee	0	0	3,288	38,287
Utah	1	1		
West Va.	1	1		
Michigan	2	2		
Minnesota	0	0	.....	24,140
Missouri	0	0		
New Jersey	0	0		
Total	60	64	201,157	757,323

*Includes spiegeleisen and ferromanganese.

Business Is Better

Holland Furnace Co., Holland, Mich., domestic heating equipment, announces that it is reopening its plant at Cedar Rapids, Iowa, closed since Nov. 14.

□ □ □

Foote Bros. Gear & Machine Co., Chicago, reports February sales were 10 per cent over January. F. H. Fowler, president, stated that the increase was devoid of any exceptionally large orders and included a healthy growth along the full line of products.

□ □ □

Birmingham Ornamental Iron Co., Birmingham, Ala., will be kept busy for several months by orders for ornamental iron work for postoffices at Shreveport, La., Greenville and Sylacauga, Ala., and the veterans' home at Biloxi, Miss.

Industrial Men in the Day's News

George Rhoads Casey, Vice President and General Manager, Treadwell Engineering Co., Easton, Pa.

UNDERLYING a career spent largely in the steel and casting industries is an education in law.

DURING the war he served in the inspection of rolled and forged materials for aircraft.

SINCE 1922 he has been manager of sales for the Treadwell company until this recent change.

ELECTION of George Rhoads Casey as vice president and general manager of the Treadwell Engineering Co., Easton, Pa., places this company under the direction of a man of diversified training and well-known in the steelworks equipment and casting industries.

Born at Long Branch, N. J., Mr. Casey received his grammar and high school education in New York city and then enrolled at Mount Pleasant Military academy, Ossining, N. Y., from which he graduated in 1904. For three years thereafter he worked, first as an office boy with McMann & Taylor, pipe cutters and fitters, in New York city. and then with the Emigrant Industrial Saving bank, New York.

In 1907 he went with a firm of lawyers. At the same time he enrolled in a night class at the New York Law school and spent his evenings in this way for a period of three years. He was admitted to the New York State Bar in 1908 and was engaged in the practice of law in New York city for three years.

In 1911 Mr. Casey joined the Treadwell Engineering Co. at Easton and learned the business by working on the floor in all departments for a period of three and a half years. In 1915 he joined the sales department of the Treadwell Engineering Co. and ever since has been with that company, with the exception of a period spent in government service during the war.

During this period he was with the Bureau of Aircraft Production, Pittsburgh, which had charge of inspection of all rolled and forged materials in connection with the government's aircraft program during the war. In this connection he served under A. K. Hamilton, Chicago, president of the M. H. Treadwell Co., of Illinois, who had charge of the bureau.

After the war Mr. Casey returned to the sales department of the Treadwell Engineering Co. and in 1922 was appointed manager of sales, which position he held until his recent election as vice president and general manager, succeeding A. A. Neave in that capacity.

Mr. Casey is vice president of the Steel Founders' Society of America, in charge of the eastern district. He is an ex-president and director of the Steel Casting Development bureau. Mr. Casey also recently was appointed receiver of the John Illingworth Steel Co., Philadelphia.

Mr. Casey's clubs are the Country Club of Northampton County, Pomfret and Sparton clubs, Easton, Pa., and the Harker's Hollow Golf club, Phillipsburg, N. J. His favorite recreations are golf, handball and horseback riding. He resides at Easton with his family.

HE. V. PORTER was elected president and general manager of Dahlstrom Metallic Door Co., Jamestown, N. Y., at the annual meeting of stockholders. He succeeds the late John A. Westman. Mr. Porter has been general manager of the company, which office he also retains.

Carl Olofson was re-elected vice president, Eric E. Carlson was made treasurer and assistant secretary and Sam Lundquist was chosen secretary and assistant treasurer. Joseph F. Rice, attorney for the company, was elected to the place on the directorate formerly held by Mr. Westman.

□ □ □

Charles V. Fish has been appointed by the Reliance Electric & Engineering Co., Cleveland, to represent it in Allentown and Northeastern Pennsylvania. He will be located at 515 North Lafayette street, Allentown.

□ □ □

C. E. F. Clarke, chairman of the board, Eastern Rolling Mill Co., Baltimore, was re-elected, along with nine other directors at the company's recent annual meeting.

□ □ □

Arnold Lenz, manager of the gray iron foundry, Chevrolet Motor Co., Saginaw, Mich., has been named one of two assistant manufacturing managers of Chevrolet Motor Co. In this capacity he will be in charge of the Flint, Mich., plant.

Floyd O. Tanner, assistant general

manufacturing manager of Chevrolet in charge of Flint, Saginaw and Bay City, Mich., operations, is now general factory manager of the Pontiac division of General Motors Corp.

Persus H. MacGregor, factory manager at Flint, will move to Pontiac, Mich., with Mr. Tanner, to become general superintendent of the Pontiac division.

William Notman, general superintendent of the motor division, Flint, Mich., assumes Mr. MacGregor's post as factory manager.

□ □ □

Robert S. Binkerd has succeeded Archibald H. Ehle as vice president in charge of sales for the Baldwin Locomotive Works, Eddystone, Pa.

□ □ □

E. P. Blanchard, for the past 12 years advertising manager and sales manager of the Bullard Co., Bridgeport, Conn., has been elected to the board of directors.

□ □ □

W. J. Kerwin, purchasing agent of Massey Harris Co. Ltd., Toronto, Ont., for many years, has left the company's service.

□ □ □

Charles J. Nieman, secretary and treasurer, Penn Iron & Steel Co., Tarentum, Pa., was tendered a luncheon recently by members of the company on his sixty-second birthday.

□ □ □

Frank Cooke recently has taken over the Meeker Foundry Corp., Norwalk, Conn., and will be president and general manager. Mr. Cooke was formerly connected with the Eastern Malleable Iron Co., Bridgeport, Conn.

□ □ □

Frank L. Estep, vice president, Perin Engineering Co., consulting engineers, New York, will sail April 8 for India, in connection with steel plant improvements and additions for the Tata Iron and Steel Co., Jamshedpur, India.

□ □ □

Charles L. Wasmer, formerly chairman of the board of the United Screw & Bolt Corp., Cleveland and Chicago, has resigned to become president of the Wasmer Bolt & Nut Co., Cleveland. In the presidency Mr. Wasmer will be in charge of sales.

□ □ □

William S. Wilbraham, who has been in charge of the estimating and order department, Lukenweld Inc., Coatesville, Pa., has been appointed assistant manager of sales. Until 1927, when he joined the sales organization of Lukens Steel Co., being later transferred to the Lukenweld subsidiary, he was affiliated with American Bridge Co.

□ □ □

H. C. Darby has been appointed district sales manager for the Inland Steel Co., Chicago, at Kansas City, Mo. He has been a member of the sales force of this office since November of 1926, and he succeeds the late Orville P. Blake, who died in February, 1931.

Mark Hill has been appointed salesman in the Kansas City office of the Inland company.

□ □ □

Frederick W. McIntyre, vice president and sales manager of the Reed-Prentice Corp., Worcester, Mass., has been elected general manager of the company.

Charles L. Stevens, of Boston, was elected president; Charles H. Carswell, manager and John F. Richeimer, assistant treasurer. Mr. Richeimer will come to Worcester from Boston.

Obituaries

PERCIVAL CHRYSTIE, 63, chairman of the board, Taylor-Wharton Iron & Steel Co., High Bridge, N. J., died at High Bridge, March 28. Mr. Chrystie started to work in the company's shops as a boy. He progressed through several departments until he became an inspector. Thence he went into the sales department. To him was entrusted the task of introducing the use of manganese steel in the Pennsylvania anthracite coal fields and so well did he accomplish this that he was soon recalled to the plant to serve as superintendent of the steel foundry.

Later Mr. Chrystie was made secretary and treasurer, and then vice president. He held the latter position for 16 years until the death of Knox Taylor, when he became president. However, he had been in poor health and resigned the presidency in 1919 to become chairman. He returned to High Bridge a year ago from California after spending some time in an effort to recuperate.

□ □ □

Adolph W. F. Manzel, 57, member of the firm of Manzel Bros., Buffalo, makers of pumps and lubricating devices, died recently at Buffalo.

□ □ □

Carl Irresberger, well-known German authority on foundry practice and author of several articles published in *The Foundry*, died recently.

□ □ □

Leslie D. Miller, 57, for 35 years head of the cost department of James B. Clow & Sons, Chicago, cast pipe, fittings and plumbing goods, died March 26 at Lake Bluff, Ill.

□ □ □

William Dwight Bunker, 61, superintendent of motive power for the Colorado & Wyoming railroad, subsidiary of the Colorado Fuel & Iron Co., died at Pueblo, Colo., recently.

□ □ □

Edward F. Ruehwein, 77, partner in Moesta & Ruehrwein Co., manufacturers' agents for iron and steel castings, of Cincinnati, died recently. He had been identified with the company for 25 years and was active in civic affairs.

□ □ □

Samuel M. Curwen, 73, president of J. G. Brill Co., Philadelphia, car builder, died at Haverford, Pa., March 28. He had been associated with the Brill organization since 1879 and was made president in 1912.

□ □ □

Bernhard Schad, organizer and for many years president of the Schad Wheel Co., Avoca, N. Y., died at Pittsford, N. Y., where he had lived since retirement from active business life. He was 77.

□ □ □

Bernard A. Behrend, 59, at one time chief electrical engineer and consulting engineer for Allis-Chalmers Mfg. Co., Milwaukee, and advisory engineer for Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., died at Wellesley, Mass., March 25.

□ □ □

Fred R. Shepherd, 53, retired president of Crerar, Adams & Co., Chicago, railway supplies, died March 21 at Highland Park, Ill. He was connected with Crerar, Adams & Co., for 35 years, becoming president in 1922 at the death of his father Edward S. Shepherd, who had been president of the company for 54 years.

□ □ □

Isaac H. Arnow, 63, secretary of the Northwestern Electric & Machinery Co., Milwaukee, died March 16. Before joining the Northwestern company, Mr. Arnow was associated for many years with the Grossman Bros. Co., a leading Milwaukee scrap metal concern.

□ □ □

Col. William A. Starrett, 55, noted builder of steel skyscrapers, died at Madison, N. J., March 25. Col. Starrett was a staunch advocate of steel in the construction of large structures, saying at one time, "Steel is the best material to use because it is the strongest. Masonry is the worst because it has no elasticity."

□ □ □

George Nicholson, 62, vice president and assistant general manager of the Vulcan Iron Works, Wilkes-Barre, Pa., died at Wilkes-Barre March 15. He became associated with the Vulcan company at the age of 18 with his father, and brother, Samuel T. Nicholson, who now is president. Mr. Nicholson was president of the Hanover Bank & Trust Co., also president of the Luzerne County Manufacturers' association.

□ □ □

Henry M. Leland, 89, pioneer in the manufacture of automobiles and airplane motors, died at Detroit, March 25. During his long business career he was successively a tool-

maker for the Springfield, Mass., arsenal, with Browne & Sharpe Mfg. Co., Providence, R. I., then Leland & Faulconer, Detroit. He founded and headed both the Cadillac and Lincoln Motor Car Cos.. Mr. Leland was one of the founders of the National Metal Trades association.

□ □ □

Eben M. Byers, recently chairman of the board of A. M. Byers Co., Pittsburgh, died at New York March 31 after an illness of two years. He was born in Alleghany, Pa., and educated at St. Paul's school, Concord, N. H., and Yale university. For a period after 1901 he was connected with the Girard Iron Co., and in 1909 was elected president of A. M. Byers Co. He was a director of the Lake Erie Dock Co., Bessemer Coke Co., and the Bank of Pittsburgh National association.

□ □ □

William T. Graham, 81, first president of the American Sheet & Tin Plate Co., Pittsburgh, and one of the founders and early officers of the American Can Co., New York, died at New York March 29. He began his business career with the Standard Iron Co., Bridgeport, O., which was taken over by the American Tin Plate Co. in 1901. In 1903, when the company was merged into the present American Sheet & Tin Plate Co., Mr. Graham was named president, a post which he held until 1908.

□ □ □

William E. Taylor, 79, one of the founders of the Republic Iron & Steel Co., Youngstown, O., died at La Porte, Ind., March 26. He began his business career with Cartwright, McCurdy & Co., Youngstown, O. Later, he was second vice president and treasurer of the Union Iron & Steel Co., and when the Republic Iron & Steel Co., predecessor to the present Republic Steel Corp., was formed in 1901, Mr. Taylor was made a vice president of the concern at Chicago. A few years later he retired to enter a LaPorte, Ind., car wheel business.

Iron Ore Quality Improves As Tonnage Is Reduced

Quality of Lake Superior iron ore shipped in 1931 improved over 1930, though tonnage was reduced by more than half. This was due to the tendency of operators to mine the better grades in seasons of reduced demand and high costs, as noted in prior years, especially in 1921. Though analyses nearly always move up as tonnage goes down, improvement sometimes occurs even in years of increased production.

The difference is slight in either event, as year after year the analyses holds close to established standards. The amount of iron natural in all the ore shipped in 1931 was 51.53 per cent, according to the Lake Superior Iron Ore association's report, just issued. This compares with 51.33 per cent in 1930. Phosphorus dropped from 0.095 per cent in 1930 to 0.087 in 1931; silica was reduced from 8.7 to 8.6 per cent; manganese from 0.82 to 0.8; and moisture from 10.92 to 10.84.

In the average analyses for the various grades, such as bessemer, nonbessemer, manganiferous and silicious, quality was slightly enhanced over 1930.

Financial News of Steel Industry

SLOSS-SHEFFIELD Steel & Iron Co., Birmingham, Ala., had profit of $79,342 in 1931, equal to $1.18 for each of its 7 per cent preferred shares. This compares with net profit in 1930 of $360,991, or $5.39 a preferred share.

□ □ □

North American Refractories Co., Cleveland, had net loss of $325,445 in 1931. In 1930 the company had a loss of $142,371.

□ □ □

Pittsburgh Screw & Bolt Corp., Pittsburgh, reports net loss of $516,846 for 1931. In 1930 profit was $1,397,052, or 93 cents a share.

□ □ □

American Radiator & Standard Sanitary Corp., New York, reports net profit of $200,646 for 1931 before preferred dividends. In 1930 the company reported net income of $6,641,797, but after preferred and common dividends, loss of $7,836,500.

Options Western Iron Ore

Henry J. Landahl, Vancouver B. C., is understood to have an option to purchase 400 acres of hematite ore on Sumas mountain, Washington from L. A. Westin, mining engineer of Bellingham, Wash. If the option is exercised it may mean the erection of a smelter at Bellingham in which the hematite and magnetite would be treated.

Cutler-Hammer Steady

Operations of Cutler-Hammer Inc., electric controlling devices, Milwaukee, are holding about steady, according to Henry F. Vogt, treasurer. Between 1200 and 1300 are employed, on a part-time basis. At the annual meeting of the stockholders, March 28, all directors were re-elected. Election of officers will take place shortly.

Here and There in Industry

FRED W. BAUER and T. L. Wilson have formed the Bauer-Wilson & Co. to sell pig iron, coke, alloys and allied products, with offices in the Straus building, 310 South Michigan avenue, Chicago. Mr. Bauer formerly was vice president in charge of Chicago district sales for Rogers, Brown & Crocker Bros. Inc., New York, and previously at Detroit, covering 28 years with that company and its predecessors. Mr. Wilson was connected with Hickman, Williams & Co. at Chicago for several years, resigning as resident manager to become Chicago district sales manager of Walter-Wallingford & Co. Bauer-Wilson & Co. have been appointed exclusive sales agents for pig iron produced by Woodward Iron Co., Woodward, Ala., in Chicago territory, including northern Illinois, northern Indiana, Wisconsin and Minnesota. The firm also represents in the Central West and Northwest, among other producers, the Niagara Falls Smelting & Refining Corp., Buffalo.

□ □ □

Horace T. Potts & Co., Philadelphia, have been appointed by Bethlehem Steel Co. as warehouse distributor of boiler tubes in the Philadelphia district and are carrying in stock a full line of both lapwelded charcoal iron and lapwelded steel boiler tubes.

□ □ □

Babcock & Wilcox Tube Co., Beaver Falls, Pa., has opened a branch office in the Ford building, Detroit, in charge of J. E. Polhemus, who has been made district sales manager. He formerly was assistant vice president and district sales manager of the Detroit sales branch of the Associates Alloy Steel Co., Cleveland.

□ □ □

Doehler Die Casting Co., Brooklyn, N. Y., has decided to abandon its policy of diversification, which had carried it into the aluminum utensil retailing field and other lines affiliated with die casting. Household Institute Inc., a subsidiary, will discontinue installment selling. A merger is being negotiated for a subsidiary, Doehler Furniture Co., a unit of which, Doehler Vending Machine Inc., will be joined with the parent company. Die casting divisions of the Bohn Aluminum & Brass Corp. and Newton Die Casting Corp. have been absorbed.

□ □ □

A. O. Smith Corp., Milwaukee, has received an order for a pressure vessel 30 feet long and 5 feet in diameter, with 3-inch walls, for delivery to the Turner oilfield in Coutts, Alberta, in April.

MIRRORS of MOTORDOM

DETROIT

DISSECTING the new Ford eight from the standpoint of materials used, castings and aluminum score noteworthy gains, carbon steel about holds its own, rustless steel suffers a slight loss.

Obviously, the new 8-cylinder 90-degree engine is the heart of the car, and to cast the block in one piece creates a problem for the Ford gray iron foundries as the varying thicknesses of different sections set up unequal strains in cooling.

Complete redesign of the brake drums, with castings replacing pressed steel, is necessitated by the higher top speed, the addition of about 100 pounds in weight to the various models, and the desirability of providing sufficient braking capacity should free-wheeling eventually be adopted.

Hub and drum assembly for the front wheels is a one piece special alloy malleable casting weighing about 17 pounds A rib around the periphery compensates for the heat generated in the act of braking, and is claimed by Ford engineers to minimize scoring of the drum and to insure a flat contact for the shoes under all conditions. A patent will be sought on this alloy.

Brake Drums Are Castings

Rear brakes present a different problem, inasmuch as the rear drums carry no load and thus are not subject to elongation, as are the front drums. The rear assembly consists of a forged steel hub and a chrome-nickel gray iron alloy drum. The malleable front wheel assembly is supplied by outside foundries, while the rear drum is cast in the Ford foundries.

Altogether, 70 pounds more castings are used in the new line than in Model A, but since these castings supplant somewhat lighter pressed steel sections, the net increase in the weight of the car contributed by these parts is less than 70 pounds. The rear axle housing, as in Model A, consists of a malleable differential gear housing to which are bolted the welded steel tubes.

Rustless steel—rustless being the official Ford designation for this class of material—surrenders its largest individual Ford use with abandonment of the bright radiator shell. Other new uses and some old ones, however, almost compensate for this loss. This is especially true on sport models.

A new and ingenious use of this material is in the tie rod, or spanner bar, between the front fenders and supplying the mounting for the headlights. Rustless steel is wrapped around a strip steel core and welded at the bottom.

Hub Caps Rustless Steel

Hub caps, of practically the same dimension as on the late Model A, are straight 18 per cent chrome on the 4-cylinder models but 18-8 material on the eight on account of the insertion of the "V8" insignia.

Head and tail lights on all models and the cowl lights on deluxe models continue rustless steel, requiring practically the same amount as in Model A despite a new design which reduces the depth of the lamps.

A strip of rustless steel completely covers the hinges in the top center of the hood. No beading is now used at the juncture of the cowl and the hood, but a rustless steel bead joins the hood and the radiator and a somewhat similar beading is used on the edge of the radiator grill.

Other uses of rustless steel are exterior door handles, windshield supports on sport models, radiator filler caps, a bead leading from filler caps to the Ford insignia on the V of the radiator shell, and a ring around the instrument panel on the dashboard. This panel, incidentally, is cold-rolled strip steel, chrome plated and engine turned.

Side rails of the frame are strip steel, rolled under sufficient pressure to eliminate the formation of scale and enabling the rails to be finished identical with the bodies. Dust shields thus are eliminated and wider running boards are bolted directly to the frame. Between 40 and 42 inches of the side rails are exposed.

Seamless steel tubing instead of cold-drawn stock is now used for the propeller shaft, enclosed in a torque tube. Rear spring perches are mounted under and to the rear of the axle; thus the spring is moved several inches to the rear, is not directly over the differential housing and permits a lower overall height. Springs are transverse, as at present, but somewhat heavier.

An aluminum crankcase replaces the pressed steel one used on Model A engines. In the V between the two banks of cylinders is a cast aluminum intake manifold which, by a diversion of exhaust gases, also serves as a preheater.

Valve ports are now machined. While display cars at the first showing March 31 were equipped with one-piece forged valves, operating directly upon the camshaft without the use of tappets, it is understood that a last minute decision was in favor of a two-piece valve.

Changes To Be Expected

This may be typical of the situation as regards the 8-cylinder line. When the public showing was made last Thursday and the price announced to be $10 higher than the comparable A models, total assemblies averaged less than one for each of the 9000 dealers. In most cities a central display was arranged.

If the history of Model A is repeated—and the chances favor it—mechanical changes will constantly be made, and since the new line is a radical departure for the Ford production department it is to be expected that slight changes in design which

will facilitate manufacturing operations will be devised.

The foregoing description of materials applies only to the 8-cylinder line. In practically all cities in which displays were held March 31 only 8-cylinder passenger models were shown. Only in commercial cars, generally speaking, could the new 4-cylinder engine be seen. For all practical purposes the 4-cylinder engine is a slight refinement of the Model A power plant, and for the present it is the 8-cylinder passenger line that will be pushed.

It was Feb. 11 that Henry Ford first officially confirmed reports of a new line, but not until March 31 was there a public showing. It is probable that something akin to this lapse of time will accrue to many parts and material suppliers until genuine volume orders are placed.

As of April 1 the situation at the Rouge plant and the various assembly branches in regard to materials was as follows: Production schedules will be based upon actual dealer demand, with no attempt to force cars upon dealers or to anticipate retail sales. Cars will be manufactured only as bona fide orders emanate from dealers.

Reports from dealers received in Detroit, Monday, April 4, will be the basis of a production schedule to be formulated in a few days.

More Parts Are Released

On some parts a final decision was reached many weeks ago—on some as early as last December—and banks of these parts have been built up reaching a total in some cases, for 50,000 cars. On parts on which a final decision has just been reached, orders are now flowing from the Rouge plant in moderate volume. Typical is a release to Kelsey-Hayes for 5000 wheels daily.

As to bodies, it will be recalled that late in 1931, after a revised four had been decided upon, orders were placed for approximately 50,000 bodies. A portion of these bodies was completed; material for most of the rest was placed and partially fabricated and assembled.

These bodies, strictly new, are figuring in current assemblies, and so far as sheets and strip are concerned it may be said that Ford has a backlog for the first 50,000 units. Hence fresh releases of body steel will be greatly tempered by these 50,000 bodies now in hand. Some material, of course, will be placed, but the volume will be less than might be expected.

With body steel thus largely accounted for, the initial impulse of Ford business apparently will be felt more by parts makers, including carburetors, electrical equipment, shock absorbers, etc. The stock of frames is much smaller than that of bodies, and substantial releases of strip for this purpose are expected. It will be the policy of the Ford purchasing department to distribute its business as widely as possible.

Obviously, with 9000 dealers seeking at least an initial display of the new eights, production will be stepped up as rapidly as possible. Last week, assemblies averaged below 200 units daily.

When Model A was introduced it required 10 weeks to attain a rate of 1000 daily. This time, Ford engineers believe they will make slightly better speed. Presumably it will be the middle of April or slightly later before what can be termed volume production will be achieved.

While a final decision has not been reached, the new Ford eight apparently will be designated either Model B or Model 18—the 18 standing for the first eight.

Ford Is Shown First

It looks like war in the low-price field.

The first advertisement announcing the new Fords appeared in the morning newspapers of Tuesday, March 29, the very date General Motors by means of 10 pages in a national weekly was announcing its April 2-9 show in 55 "key" cities.

By just two days the first showing of the eight March 31 anticipated the opening of the General Motors show and the presentation of the new Plymouth. On the night of March 31, by radio, Chevrolet countered with the announcement of a reduction in price and some rather plain inferences that any engine above a six may be less economical.

By its new scale of prices, Chevrolet either approximates or cuts under the Ford eight by as much as $30. Plymouth, especially in its "thrift models"—standard chassis with certain refinements in the body omitted—is slightly lower. For all general purposes, the public is offered a four, six and eight in what might be termed the $500 class.

Reports, especially current at Detroit, that Chevrolet was experimenting with a four and an eight, were met by public announcement that Chevrolet would continue a six. There was no commitment, however, concerning the possibility of another low-price car by General Motors.

Save 15 Cents A Share

There is probably some significance in the fact that General Motors is setting its house in order by combining Buick-Olds-Pontiac sales and Chevrolet-Pontiac and Buick-Olds manufacturing operations just as the contest for low-price car business is intensified.

In the amalgamation of sales effort and concentration of the remnants of the Buick-Olds-Pontiac staff at Detroit, a saving of over $6,000,000 a year or almost 15 cents a common share is effected. The merger of manufacturing operations is proceeding slower, but unquestionably General Motors subsidiaries will tend to become self-contained and use present idle capacity.

The announcement that Chevrolet will continue a six is accepted at face value in Detroit, but it can be stated as a fact that General Motors engineers have been figuring costs on parts for a car smaller than Chevrolet. There is considerable speculation that if the new Ford and Plymouth competition appears to call for a General Motors car lower priced than Chevrolet, this car will be sponsored by Pontiac.

Unquestionably, the policy of General Motors, Plymouth, Willys—and manufacturers in the $1000 class as well—will be to acertain the actual performance of the Ford eight. Much will depend upon the gasoline consumption and service charges of the new Ford.

Ask Steel Men To Attend

With General Motors, Ford and Plymouth keying their sales effort to a record high pitch, the trend of general business may be in the making this week. General Motors has asked all its parts and material suppliers to see that their employes are apprised of the immediate value of attending the show.

For its 10 pages of advertising in only one national weekly General Motors has spent $115,000 for the space alone. Ford has supplied most of its dealers with movies and talkies expounding the merits of the new eight. Chrysler and other manufacturers have greatly expanded their sales and advertising efforts at this time.

Evidencing that the Ford price basis is reaching into the higher levels, Hupp has reduced its prices on the 6-cylinder line as much as $280, bringing its roadster—lowest priced of the line—down to $795.

Ford Buys Equipment

Youngstown, O.—Ford Motor Co., Detroit, has awarded a contract for hot metal equipment, including cars and ladles for the Rouge blast furnaces, to the William B. Pollock Co., Youngstown. This company also has booked an order for open-hearth ladles for the Lukens Steel Co., Coatesville, Pa.

Gear Makers Move Offices

Headquarters of the American Gear Manufacturers association have been moved from 3608 Euclid avenue, Cleveland, to the Ninth-Vincent building. Secretary is T. W. Owen.

EDITORIAL

It's Time To Curb Deflationary Buying, Suicidal Selling

IS IT not time to call a halt on senseless selling? Of the many unpleasant aspects of the present business situation, none is more deplorable than the everyday spectacle of the needless sacrifice of profits by sellers in their panic-stricken efforts to land contracts.

Consider the case of a manufacturer who asked for bids on a lot of standard parts of heat treated alloy steel. He expected the quotations to range between $1200 and $1500. Imagine his surprise when, on opening the sealed proposals, he found the highest offer to be $1200 and the lowest $700. What explanation is possible other than that the low bidder disregarded costs, profits and even business sanity in a mad attempt to get the order? No other answer can account for such a wide discrepancy in bids on this comparatively small transaction.

Again, consider the story related in a recent issue of *National Petroleum News,* which publication has been waging a strong campaign against "chiseling." An oil company sent out inquiries to eight equipment companies. Six of them submitted bids at around $38,000. On the day following the closing date salesmen representing five of the six bidders appeared at the purchasing agent's office. Two of the five tendered cuts from their original proposals; one stood firm on his bid; and two, after asking for time to consult their headquarters, finally submitted prices lower than those quoted originally. Several days later two of the four "revisers" again cut their bids. On the fifth day the contract was awarded for $26,000.

Failure To Stand On Original Bids Results in Waste of $12,000

The saving of $12,000 or 31 per cent to the buyer was not due to any pressure on his part. He simply waited. The sellers can blame no one but themselves for this shameful exhibit of spineless selling.

Unfortunately the foregoing incidents are typical of scenes that are being enacted every day in the manufacturing industries. In spite of repeated efforts to establish the principle of "firm bidding," millions of dollars are being thrown away futilely because sellers are not courageous enough to stand pat on their original tenders. Equipment builders; plate and structural fabricators; and producers of rolled steel, forgings, castings and pressed steel products have suffered acutely through the collapse of sane bidding.

Not a few commentators on this problem have placed part of the blame on the buyers. The term "deflationary buying" has been coined to designate the practice of purchasers who use undue pressure to beat down prices. Everyone who is familiar with present market practices knows that certain buyers—fortunately in the minority—take unfair advantage of sellers. However, we believe the greater opportunity for remedying the situation lies in the attitude of the vendors. For every dollar thrown away because of the "chiseling" tactics of purchasing agents, several dollars are wasted through the panicky attitude of sellers.

Problem Is Squarely Up to Executives; They Have Power To Act

Many industrial leaders think that this deplorable state of affairs could be alleviated by modifying the antitrust laws to permit companies to co-operate in "stopping cut-throat competition." This view was expressed by 723 out of 774 manufacturers who recently balloted on this question under the auspices of the New England council.

Everyone will agree that an intelligent revamping of antitrust legislation would help, but it is a mistake to assume that such revision would solve the problem. The roots of the evil go far deeper than federal regulatory statutes or the codes of ethics of trade associations; they take nourishment from the frailties of the individual.

The scourge of suicidal selling and deflationary buying can be curbed effectively if the administrative heads of manufacturing companies will face the facts squarely. The responsibility is theirs; they cannot evade it by passing it on to their sales managers and purchasing agents.

Mr. Executive, this problem of all industry is also your individual problem. You can exert a powerful influence in cleaning up this bad situation by doing two things:

1. Tell your sales manager to submit one carefully prepared bid and stick to it.

2. Tell your purchasing agent to buy on the basis of original bids. Unless tenders are unreasonable or manifestly in error, do not permit bidders to revise their figures after bids are closed.

THE BUSINESS TREND

Taxes and Auto Sales Hold Stage of Business

SELDOM has it been more difficult to unscramble the mixed factors affecting the business outlook than at the present time. During the past week sentiment was kept on pins and needles by the erratic progress of the tax legislation in the lower house of congress. Discouragement engendered by the revolt at the beginning of the week gave way to encouragement when subsequent acts of congressmen evidenced that as a body they really mean to help balance the budget. Controversy over loans of the Reconstruction Finance Corp. to the Missouri Pacific railroad and over the provisions of the Glass bill were disquieting—not because of the degree of merit in the arguments, but because serious disagreement on important national policies means delay and possibly nullification. On the other hand, the President's stand against the threatened demand for payment of the soldiers' bonus was heartening.

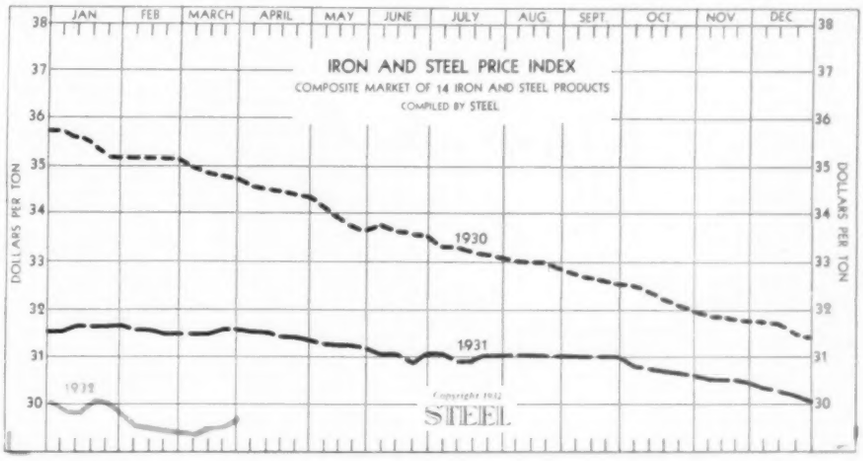
Several important business barometers are more favorable. In the week ending March 19, car loadings again established a new high for 1931, thanks not only to another sharp gain in coal shipments but also to a wholesome increase in miscellaneous freight. Coal output in that week was slightly below that of the preceding week but somewhat above the production in the corresponding week in 1931. The net operating income of Class I railroads for February promises to run far ahead of January figures, in spite of a lower gross. Statistics on bank failures, money in circulation, etc. continue to reflect improvement.

The unfavorable indicators include an increase in crude oil output, a drop of 10 per cent in the production of electricity, and a further slump in steelworks operations.

Public Response To Automobile Shows Is Key To Early Business Outlook

Beginning today and continuing for several weeks attention will be focused on automobile sales If the General Motors, Chrysler and Ford drives go over even with moderate success, industry will be given a much needed impetus. If they fail, we shall be obliged to look in other directions for the spark that will restore a semblance of life to industry.

In some quarters observers find encouragement in what appears to be a more sensible attitude on prices. Here and there the futile slashing of quotations to meet fancied competition is being abandoned. This is evidenced in the relative stability of finished steel prices, although as yet the firmer quotations have not been tested against real tonnage.



1932	
Mar. 26	$29.81
Mar. 19	29.57
Mar. 12	29.55
Mar. 5	29.53
Feb. 27	29.53
Feb. 20	29.53

1931	
Mar. 25	$31.71
Mar. 18	31.71
Mar. 11	31.61
Mar. 4	31.61
Feb. 25	31.61
Feb. 18	31.61

Feb., 1932	122,890
Jan., 1932	123,075
Feb., 1931	229,811

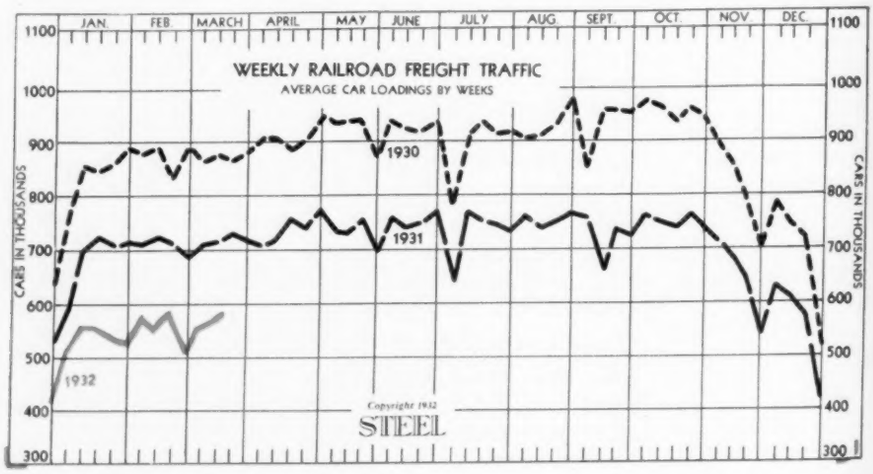
Automobile Production Still Lags; February Output Drops

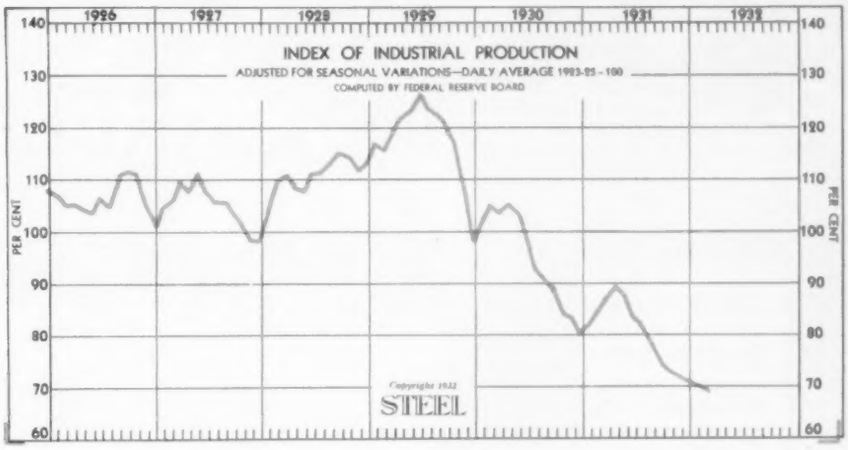
Thus far in 1932 the trend in automobile production has shown little tendency to change. According to the monthly report of the United States department of commerce, February's production totaled 122,890 units, compared to 123,075 cars for January. Output for the same period last year was considerably higher. The total in January 1931 was 178,344 units, while in February that figure was exceeded by 50,000. For the two months of 1932 production has aggregated 245,965 units, considerably under the 408,155 set during the same period of 1931. Confronted with the delayed introduction of improved Ford cars, other car manufacturers have operated on a conservative basis. Consumer buying has been the lowest in more than ten years.

Car Loadings Continue Upward; Reach Highest Point for 1932

Railroad freight car loading continued to recover from the rather poor showing made during the first two months of this year. For the week ending March 19 loadings were the highest for the year with a total of 584,634 cars. This was an increase of 9153 cars above the preceding week but 159,619 cars below the corresponding week last year. The deferred cold weather of March has aroused the activity of the coal market and shipments of that product totaled 131,067 cars, a gain of 3096 over the corresponding week last year. Grains, forest products, merchandise and miscellaneous freight all declined. Loadings thus far this year aggregate 6,234,754 cars compared with 7,874,899 cars for the same period last year.

	1932	1931
March 19	584,634	744,253
March 12	575,481	733,580
March 5	559,439	723,215
Feb. 27	535,498	681,221
Feb. 20	572,606	713,156
Feb. 13	562,465	720,689





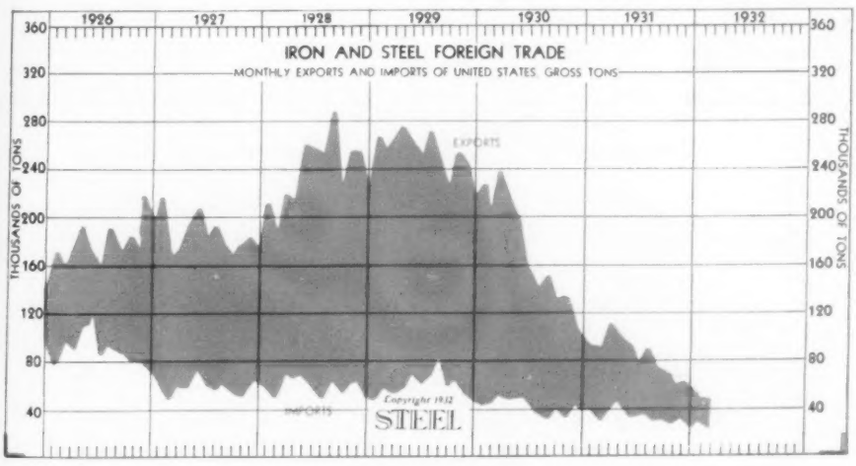
Feb., 1932	70
Jan., 1932	71
Feb., 1931	86

Index of Industrial Production Continues to Lose Ground

The index of industrial production compiled by The Federal Reserve board continued to lose ground in February. It was off one point to 70 from the revised index for January. A year ago a gain from 82 to 86 took place and two years ago there was a gain from 103 to 107, while for the same period in 1929 there was a loss of one point to 117. Among the component parts of the index, manufactures dropped one point to 69 with adjustment for seasonal variations. Building construction dropped from 31 to 27 in value of contracts awarded. In the manufacturing group iron and steel declined two points from 43 to 41, textiles from 89 to 87, automobiles dropped 11 points, while leather and shoes gained three points from 84 to 87.

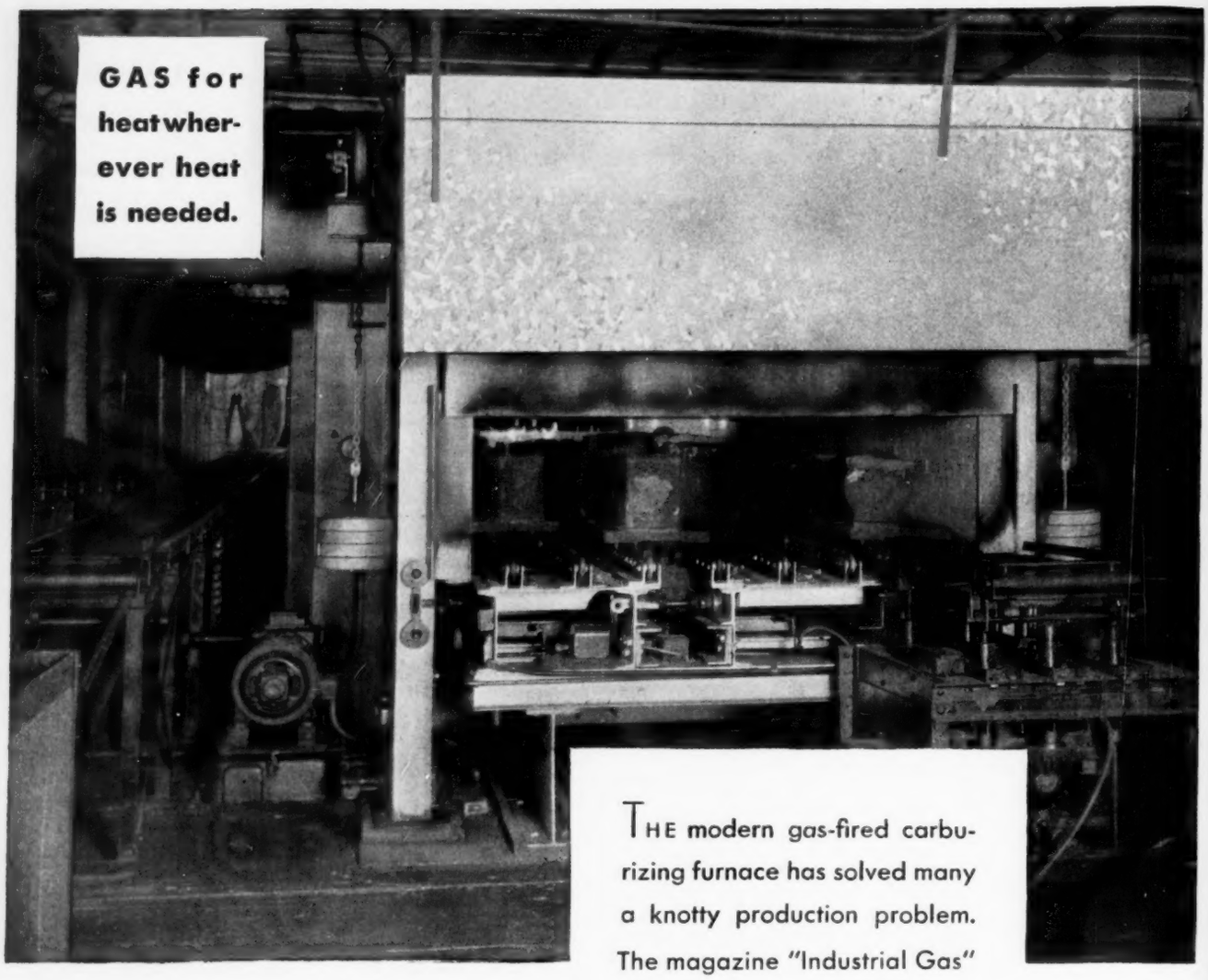
Export Trade of Iron and Steel Steady As Imports Drop

Both export and the import trade in iron and steel products was carried on in smaller volume in February as compared with January. Steel imports declined from 31,053 gross tons in January to 26,738 tons in February, while the decline in exports was relatively small, having dropped only 168 tons for a total of 40,492 gross tons in February. Thereby, the United States favorable trade balance, which was almost obliterated in January, became more firmly established. Total iron and steel tonnage exported during the two months of 1932 was 81,152, a drop of more than a hundred thousand tons from the same period last year, while the shrinkage of imports was less marked, it being only 11,882 tons.



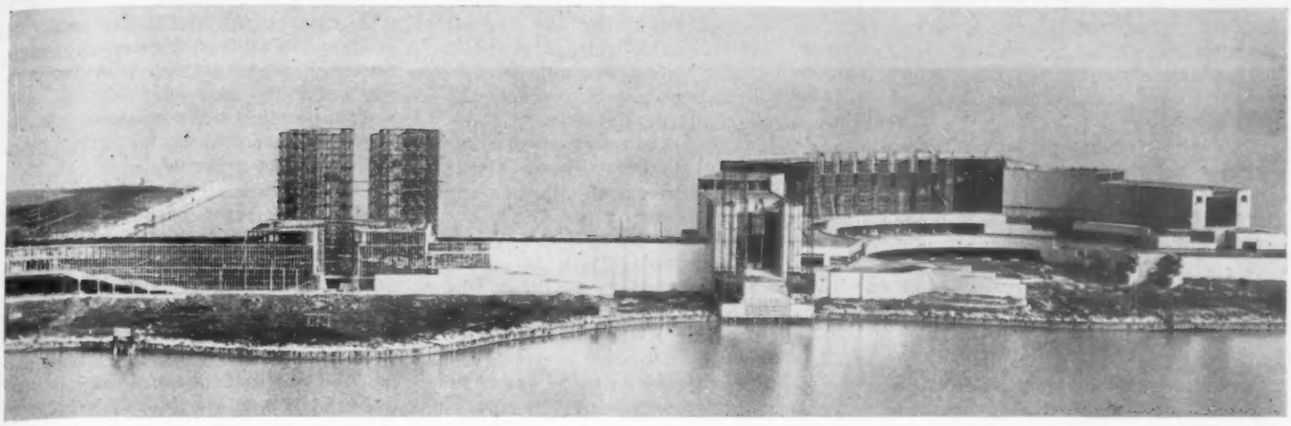
Exports	Tons
Feb., 1932	40,492
Jan., 1932	40,660
Feb., 1931	91,161
Imports	
Feb., 1932	26,738
Jan., 1932	31,053
Feb., 1931	28,045

Gas HEAT for CARBURIZING



THE modern gas-fired carburizing furnace has solved many a knotty production problem. The magazine "Industrial Gas" may help you solve your problems. Send for free copy.

AMERICAN Gas ASSOCIATION
420 Lexington Avenue, New York



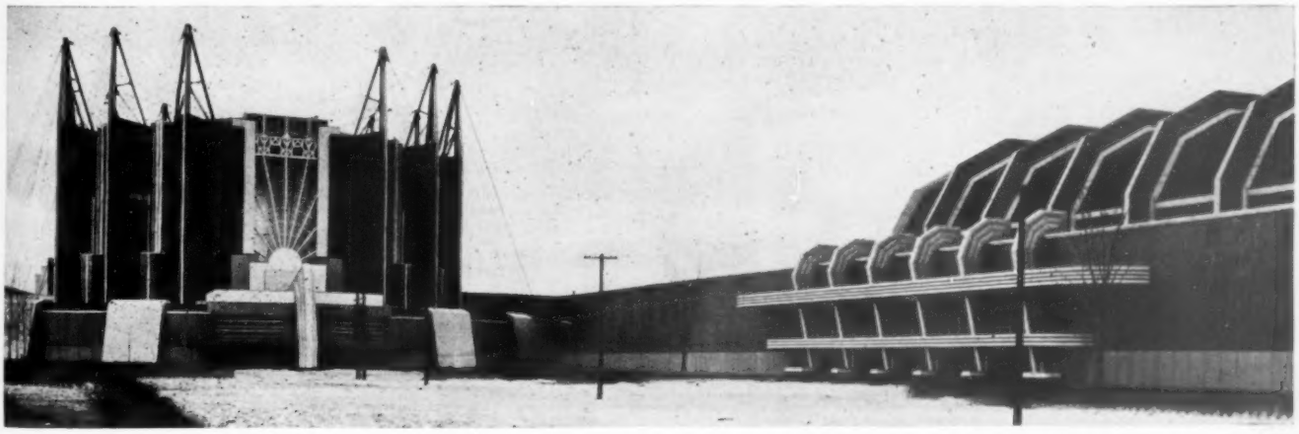
Electrical Group buildings on northerly island of the exposition grounds, as they appeared about two months ago

International Exposition Buildings Feature Low-Cost Construction

BY BERT M. THORUD
Structural Engineer, Department of Works, A Century of Progress Exposition

STEEL has proved an important factor in the development of low-cost construction for the buildings of *A Century of Progress* international exposition to be staged in Chicago in 1933. Up to the present, a total of 8242 tons of steel has been used in the construction of buildings already standing or nearing completion. A half dozen other structures are to be built in addition to foreign buildings, those of the amusement group, and buildings for exhibits of several industrial corporations.

The department of works of the exposition, which is in charge of the development of construction details for execution of the designs of the architectural commission, has conducted intensive research to determine the most economical materials, considering production cost and low cost of fabrication and erection. The exposition site, on the Chicago lake front, is on grounds under the jurisdiction of the South Park system. The contract with the park commission requires that all buildings shall be removed at the expiration of the exposition. The land is entirely "made" land consisting of a heterogeneous fill varying from good compact hydraulic sand to dump fill from 20 to 40 feet deep. Below, there is a layer of soft silt-like earth which averages 35-foot additional depth before hard pan is reached. Where foundations are placed on good sand fill, spread footings



Travel and Transport building as it appeared the latter part of February, this year. The cable suspended dome is 125 feet high and 200 feet across

are permitted. Most of the ground, however, does not permit placing any positive value to the soil even for holding short length piles, thus requiring long piles driven to refusal at hard pan.

The following requirements therefore are set up as the conditions to be satisfied in determination of the most economical framework: Satisfactory space arrangement for general and special exhibition purposes; minimum piling for foundations; minimum fire hazard; and maximum facility for dismantling and maximum salvage value.

Twenty feet has been selected as the most desirable division of space for typical exhibition booths, and also is the economical span for steel truss joists for the support of floor, terrace and roof decks. The cheapest floor and roof decks developed are either light-gage ribbed metal sections or douglas fir five-ply panels which can be laid in large pieces at a low labor cost.

Truss Joists Adopted

These require joists for support at spacing not over 2 feet for floors and terraces and 3 feet 4 inches to 4 feet for roofs, for which truss joists have proved the cheapest system. Investigation also has developed that exterior wall coverings of either light-gage vertical ribbed metal siding fastened to horizontal girts or various wall boards on wood studs effect a considerable saving over any others thus far considered. The 20-foot span also is economical for girts or spandrel beams to support these wall constructions for both gravity and wind loads.

Based on this determination, the typical framework of the various buildings has developed into a system of girders and columns extending across the width of the buildings at 20-foot intervals with steel joists extending lengthwise of the building framed to the girders. This also satisfies the general bracing of the building, as typical girder web connections, together with suitable seat angle connections to the columns, form bracing bents for the typical story units. High stories or halls have suitable wind bracket connections. Bracing beams replace the steel joists on parallel column lines.

Although a satisfactory system has been developed for utilizing single piles under exterior wall columns and a minimum of two piles under the interior columns, the light dead loads of the structure permit relatively long spans of girders to stress the piling and the minimum column sections to their full safe-load capacity. This increases tonnage of steel economically as the girder span increases, by reduction of the cost of piling per foot of span.

Windows Eliminated

Large halls are framed economically with trusses or deep-rolled sections. Towers, pylons, projecting bays, fins, and canopies, which generally occur on all buildings are usually framed of columns, or light struts, girts, and diagonal bracing. Open spaces between web members of the joists, between floor decks and ceilings, are utilized as ducts of an exhaust ventilation system, the buildings being generally windowless, thus saving expensive duct installations.

The structural steel frame is designed for typical field connections to be bolted and for all special cantilever or wind bracket field connections to be riveted. All shop connections are riveted. This permits easy dismantling and maximum salvage value.

In the design, maximum fiber stresses of 21,000 pounds per square inch for gravity loads and 28,000 for combined gravity and wind loads, with corresponding increases for direct compression, tension and shear stresses are used for structural steel, and 18,000 maximum stress for the steel joists. The steel joists are bridged rigidly by stiff member bridging clipped to the joist chords and welded to the parallel steel beams. Joists are attached securely to girders by a plate and U-bolt clip which holds the joist firmly to a full bearing. Full load factors, thorough bracing, and limitation of deflections are carefully assured.

Data and special features of the structural steel of the buildings thus far constructed include:

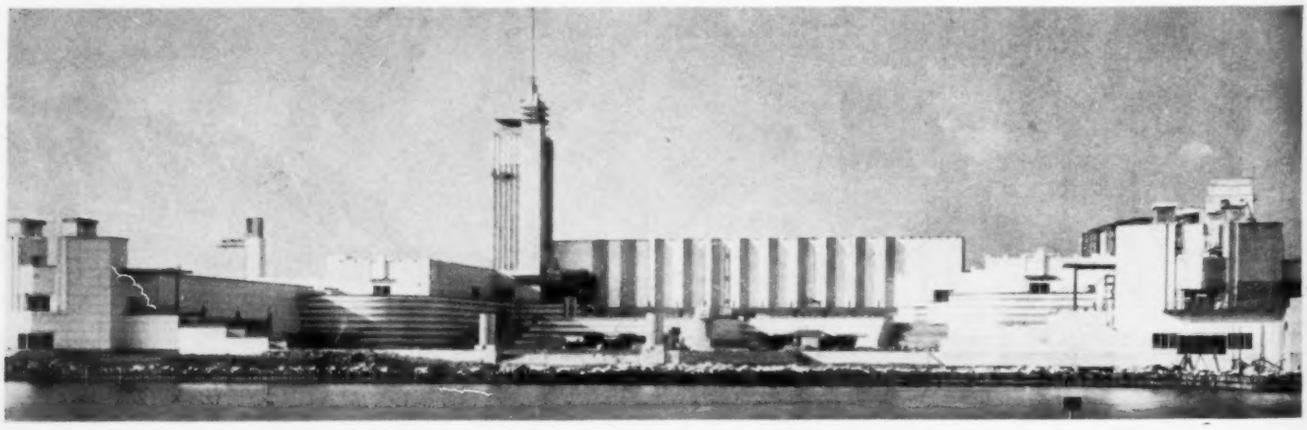
Administration building—Cubic content, 1,080,800 cubic feet; gross floor area, 84,286 square feet; structural steel, 442 tons; steel truss joists, 102 tons.

This building, the first to be completed, differs from the typical exhibition buildings in that it is primarily for administration offices, and therefore has considerable window space and is designed for lighter live loads. The framing is typically girder and column bents supporting steel truss joists. As most of the windows are continuous sash, the walls are framed of vertical angles to the floor spandrels, projecting up to sills above and down to window head below, with metal studs framed between horizontal angles at the sill and head. Two features of this building are an exhibition hall, 30 x 114 feet, and 36 feet high, and a trustees' room, 37 x 58 feet, and 24 feet high, in which distinguished visitors are to be received. The building is designed in the form of a large letter E.

Steel Provides Economy

Travel and Transport building—Cubic content, 11,057,000 cubic feet; gross floor area, 349,500 square feet; structural steel and cables, 2488 tons; steel truss joists, 299 tons.

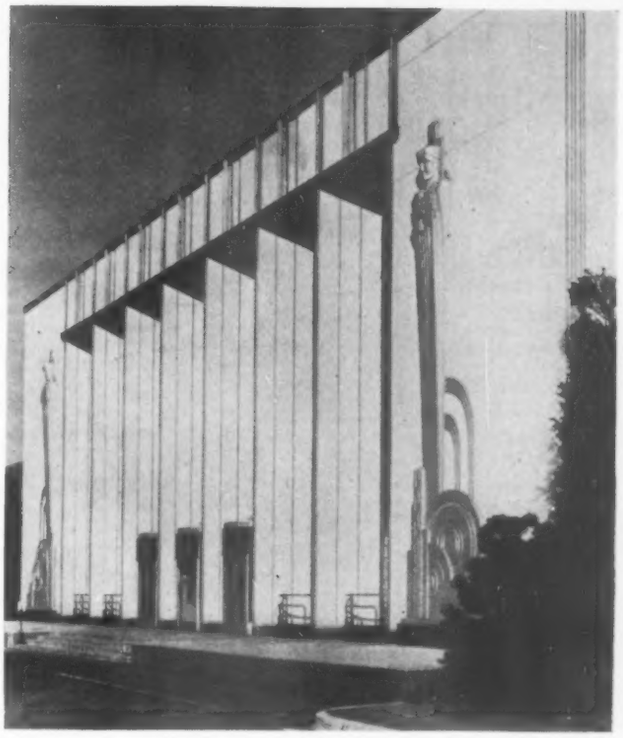
This building was the first of the strictly exhibition halls to be completed, and it illustrates the economies resulting from steel construction. Two distinct units comprise this buiding. One is the main exhibition area, a 2-story structure 1976 feet long and 146 feet wide, of typical framing except where a special exhibition hall occurs which covers an area approximately 100 by 260 feet. This hall has vertical straight walls of 43 feet and a cir-



The Hall of Science, now nearing completion. This view is from across an adjoining lagoon and was taken about four months ago

cular vaulted ceiling giving a height of about 78 feet at the center. The hall is framed with 3-hinged arches, 31 feet on center with roof beams and purlins framed to the inner chord, the trusses extending above the roof, covered as fins. The other unit is the circular, cable-suspended dome which embodies some highly advanced features of design and construction (see STEEL, April 23, 1931, page 51).

The need for entirely unobstructed interior space and the trend toward economy in construction determined the design of the cable-hung dome, the roof of which depends for its support upon suspension cables hung from twelve steel towers. This is simply the principle of the suspension bridge adapted to building construction. The type of exhibits to be shown in this dome—locomotives, railway equipment and the earliest means of modern transportation of all kinds in contrast to the most up-to-date transportation units—required a maximum amount of uninterrupted space, both in plan and height. The structure is more than 300 feet in diameter at the ground overall and with a high portion of 206 feet interior diameter extending about the height of a 12-story building.



MAIN facade of the Administration building, first of the exposition structures to be completed. Unusual architectural treatment was given to this as well as other buildings of the group

Unusual Interior Patterns

Hall of Science—Cubic content, 7,847,000 cubic feet; gross floor area, 408,400 square feet; structural steel, 2150 tons; steel truss joists, 640 tons.

The main hall, 260 x 60 feet, and 50 feet high to ceiling, is framed with bents of trusses and columns 20 feet on centers, supporting steel truss joists. The east wall, facing a huge court formed by the wings of the building features unusual treatment. Triangular bays, extending full height of the facade, framed with struts and girts supporting wood studs, have an exterior facing of wall board perforated in a pattern of abstract representation of tree branches. The inner wall surface of the hall extends straight, forming a closure for the back side of the space within the bays. This space houses apparatus to illuminate through the perforated pattern for exterior decorative effect at night.

The hall is located over the second floor of the structure and the first story extends out into the court, its roof forming a terrace 300 x 100 feet, framed in typical panels. At the west of the hall, the third floor projects 10 feet into the hall as a cantilevered balcony.

A tower 34 x 38 feet in plan extends 154 feet above grade, the top 12 feet having openings on all sides for a set of chimes. A small turret at one corner extends to 175 feet above grade over which a flag pole extends an additional 51 feet.

At the north end of the building is a one-story unit, circular in plan, of 236 feet diameter, the roof of which forms a terrace. A ramp 60 x 178 feet leads up to the terrace. A circular well exposes (or opens on) a ground floor court in the center. The framework of this unit is of concentric rows of columns, with girders framed on the chords or radially, supporting panels of steel joists.

Around the semicircle south of this circular unit, a group of pylons extends 59 feet above the terrace with curved main walls set back between the pylons, extending 52 feet, having projecting balconies at the third floor level, larger massive pylons extending 75 feet, terminating the semicircular facade.

Electrical building—Cubic content, 5,772,000 cubic feet; gross floor area, 238,000 square feet; structural steel, 1812 tons; junior beam joists, 32 tons; steel truss joists, 257 tons.

A great hall, semicircular in plan, forms the main portion of a semicircular wing at the south end of

Steel framework of the Administration building under construction, August, 1930. Workmen have begun applying the outer wall panels

this building, skirting a circular court on the west which faces the lagoon. The balance of this wing, located between the hall and the court, forms two levels of terraces, with exhibition floors below. The hall extends 578 feet along the wall on court side curved to a radius of 164 feet, and 715 feet along the outer wall, to a radius of 212 feet, and varies in height from 54 feet to 70 feet clear above the floor, which is at grade level.

Columns and Framing Exposed

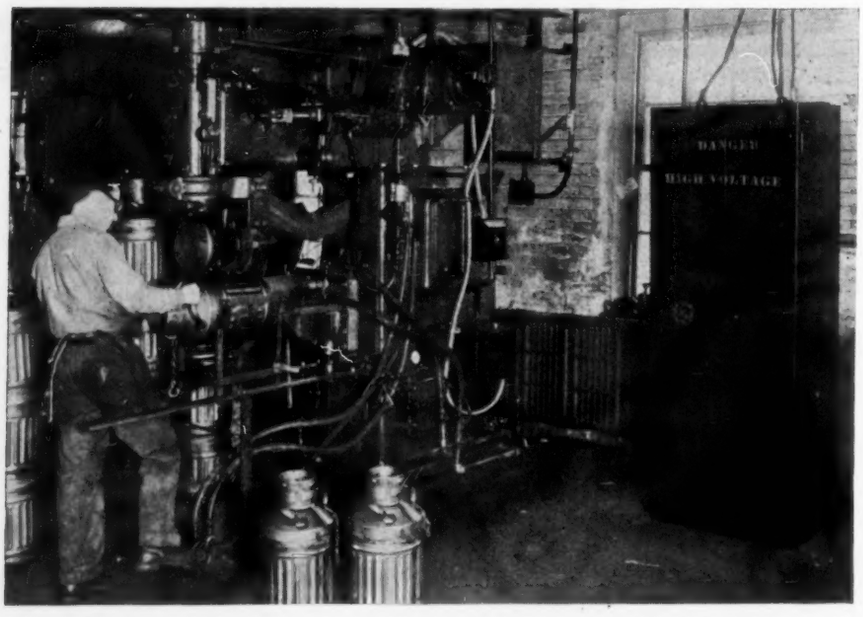
Columns formed of two 16-inch C.B. beams set with webs parallel and flanges laced connected with riveted brackets to double 21-inch C.B. girders spanning 48 feet, provide a highly economical form of construction forming wind bracing bents. Steel beams frame between the girders supporting steel truss joists set radially for decorative effect. Curved steel girts are framed to the exterior face of columns to receive ribbed metal exterior facing on the outer wall and wood studs for exterior wall board covering on the court wall. Interior wall board will be placed between columns, covering the wall framework, but the columns, and the entire roof framing including the under side of the ribbed metal roof deck, will be exposed.

Two free standing pylons have been erected at one end of the curved hall, at the edge of the lagoon. Between the pylons a broad stairway leads from the water level to a terrace level entrance into the hall, opening on another broad interior stairway down to the ground floor level of the hall. The pylons are 14 x 22 feet at the base and extend 89 feet in height above grade or 96 above the water. The lagoon facade slopes back to the top and is treated with sculptured plaster facing.

A hall 110 x 90 feet, and two stories high, is located at the center of the communications exhibit wing. Interior columns to the roof are placed at the corners of a polygonal plan, forming an octagon with three of the eight sides cut away on a line parallel to the short diameter, which is 90 feet. The second floor extends into the hall as a balcony around an open subtended octagonal well of 54 feet short diameter. The girders of the floor framing occur radially to the corners of the octagon, and cantilever over interior columns in the lower story, to the edge of the well. These girders support junior beam solid web joists.

Four large steel frames rising 100 feet in the air will be decorated in simulation of trees and will form a unique landscaping feature in a vast garden facing the lake. Faced with stucco and decorated in black, gold and green, and ranged about a fountain, these tree forms will be an artistic feature of the electrical group (see STEEL, March 14, 1932, page 13). The framework of each tree consists of small section H-beams and angle vertical struts and horizontal girts with diagonal bracing throughout. The lower sections of these tree forms will be roofed and the enclosed space utilized to form pavilions for exhibition purposes for the telephone and telegraph industries.

A radio hall comprising a rectangular wing at the north end of the group completes the electrical group. On the second floor an area 160 x 40 feet free of columns has been set aside for three glass inclosed radio broadcasting studios. The ground floor under the studios is arranged to house exhibits of radio and radio equipment manufacturers.



THYRATRON TUBES GOVERN SPEED OF INTERMITTENT LINE AND SPOT WELDING: Close and accurate control of the frequency of current interruption in line welding, and an increase in speed of interrupion up to 1800 per minute are accomplished by a new type of thyratron tube timing control announced by General Electric Co., Schenectady, N. Y. The above installation of the equipment is at the plant of George D. Ellis & Sons Inc., Philadelphia, in connection with the manufacture of oil cans in which side, top and bottom seams are welded by the intermittent line welding method. Higher production, more uniform welds and fewer rejects are reported

Stress in Welded Joints Is Studied by Optics

Through adaptation of a well-known principle in physics, S. C. Hollister, professor of structural engineering, Purdue university, Lafayette, Ind., has developed a method to show the extent and location of stresses in welded steel structures.

Prof. Hollister has constructed about a dozen models of typical welded structural steel frames from celluloid and by projecting polarized light through these models he is able to show the location and degree of stress in each part of the structure. This is an application of the principle that transmission and diffraction of light through a transparent material are altered by the stress imposed upon it.

Recently addressing the Western Society of Engineers in Chicago on the subject of "Locating the Stresses in Welded Structural Connections," Prof. Hollister exhibited his models and projected images on the screen. The models are exact reproductions in miniature of the standard steel sections as proposed for welding and include practically all of the connections employed in the ordinary building as designed to make use of welding instead of riveting.

When light is passed through the models and load is applied, rainbows show the exact location and comparative amount of stress in each part of the structure, particularly in the welded joint which is the point under study.

Purchasing Agents Plan Detroit Meeting in June

Seventh annual International Convention and Inform-a-Show of the National Association of Purchasing Agents will be held at the Book-Cadillac hotel, Detroit, June 6-9, according to recent announcement from the association offices, 11 Park place, New York. The Inform-a-Show is an industrial exhibit by means of which products and services are brought to the direct attention of purchasing agents.

Foundrymen Arrange Program For Detroit Convention

AN ATTRACTIVE program, including technical sessions, shop courses, roundtable discussions and plant visitations has been arranged for the thirty-sixth annual convention of the American Foundrymen's association in Detroit, May 2-5.

Interest in the foundry industry will run high, for coincident with the Foundrymen's convention several closely related organizations will conduct meetings, these including the Foundry Equipment Manufacturers' association, Gray Iron institute, Malleable Iron Research institute and Materials Handling institute. Adding a somewhat more general industrial atmosphere, the management, maintenance and materials handling divisions of the American Society of Mechanical Engineers has scheduled its Three-M congress for May 4-5.

Each association will maintain headquarters at Hotel Statler, where all technicai and business sessions will be held. Facilities are available for each planned activity and this should assist to concentrate interest.

Papers scheduled for the American Foundrymen's association sessions are of a high caliber and deal with important recent developments in the production of all types of castings. The discussion, likewise, is expected to bring out information of considerable usefulness.

Roundtable discussion groups are scheduled to deal with steel, nonferrous and malleable founding, pattern production and iron foundry shop tests. For the benefit of practical shop men, shop operation courses will be conducted on steel, nonferrous and gray iron founding, these being in the nature of instructional courses in fundamentals of casting production, such as sand control, foundry facings, furnace operation and heat treatment.

The tentative program announced by the association is as follows:

Monday, May 2

MORNING

Registration and plant visitations.

AFTERNOON

Shop Courses

Sand control—Session 1.
Gray iron founding—Session 1.

Tuesday, May 3

MORNING

Sand control shop course—Session 2.
Official opening of convention.

Steel Founding

"Production and Application of Manganese Steels in Australia," by D. Clark and J. Coutts, Newcastle, N. S. W., Australia. Exchange paper of Bureau of Steel Manufacturers of Australia.

"Manufacture of Stainless Castings," by T. Holland Nelson, Philadelphia.

"Some Factors Affecting the Cleanliness of Steel Castings," by Dr. C. H. Herty Jr., bureau of mines, Pittsburgh, and C. F. Christopher and M. W. Lightner, Carnegie Institute of Technology, Pittsburgh.

Nonferrous Founding

"Refractories in Brass Melting Practice," by A. E. Rhoads, Detroit Electric Furnace Co., Detroit.

"Phosphorus in Red Brass," by R. W. Parsons, Ohio Brass Co., Mansfield, O.

"A Method for Study of Shrinkage and Its Distribution in Castings," by N. B. Pilling and T. E. Kihlgren, International Nickel Co., New York.

AFTERNOON

Roundtable Discussions

Nonferrous cast metals.
Steel castings.
Gray iron founding.

Shop Courses

Steel founding—Session 1.
Gray iron founding—Session 2.
Nonferrous founding—Session 1.

EVENING

Sand Research

"Grain Size and Bond Distribution in Synthetic Molding Sand," by A. H. Dierker, engineering experiment station, Ohio State university, Columbus, Ohio.

"Mold Condition control," by H. W. Dietert, United States Radiator Corp., Detroit.

"German Sand Control Methods," by Dr. H. Reis, Cornell university, Ithaca, N. Y.

Wednesday, May 4

MORNING

Sand control shop course—Session 3.

Nonferrous Founding

"Casting Properties of Nickel Bronzes," by N. B. Pilling and T. E. Kihlgren, International Nickel Co., New York.

"Influence of Design on Brass and Bronze Castings," by L. H. Fawcett, Naval Gun Factory, Washington.

Nonferrous division business meeting.

Gray Iron Founding

"Use of Silicon and Manganese Briquets in the Cupola," by L. H. Ransom, Keystone Driller Co., Beaver Falls, Pa.

"High-Test Irons," by H. H. Judson, Gould Pumps Inc., Seneca Falls, N. Y.

"Pearlitic Cast Irons," by H. J. Young. Exchange paper of Institute of British Foundrymen.

"Use of Molybdenum in Cast Iron," by

J. Kentsmith and E. R. Young, Detroit.

AFTERNOON

Pattern production roundtable discussion.

Apprentice Training

"How Much Does It Cost To Train Foundry Apprentices?" by J. Franklin Carlz, Clark Bros. Co., Olean, N. Y.

"Successful Foundry Apprenticeship in a Small Manufacturing Plant," by W. E. Rutz, Giddings & Lewis Machine Tool Co., Fond du Lac, Wis.

Shop Courses

Steel founding—Session 2.
Gray iron founding—Session 3.
Nonferrous founding—Session 2.

EVENING

Informal dinner of American Foundrymen's association and Foundry Equipment Manufacturers' association.

Thursday, May 5

MORNING

Sand control shop course—Session 4.
Annual business meeting.

Gray Iron Founding

"Melting High-Test Iron in the Brackelsberg Furnace," by D. J. Reese, Whiting Corp., Harvey, Ill.

"A Shop Method for Determining Volume Changes Occurring in Cast Iron During Melting," by C. M. Saeger Jr. and E. J. Ash, bureau of standards, Washington.

"The Open-Hearth Furnace as a Means of Recovering Cast Iron Borings," by T. L. Joseph and C. E. Wood, bureau of mines, North central experiment station, Minneapolis.

Malleable Founding

"High-Silicon Pig Iron for Malleable Iron Manufacture," by A. L. Boegehold, General Motors Research Laboratory, Detroit, and C. F. Joseph, Saginaw Malleable Iron Co., Saginaw, Mich.

"Short-Cycle Malleablizing," by H. W. Highriter, Malleable Iron Research institute, Cleveland, and R. Schneidewind, University of Michigan, Ann Arbor, Mich.

"Effect of Thermal Treatment on Characteristics of Black-Heart Malleable Iron," by Tario Kikuta, Tobato Foundry Co., Tokyo, Japan.

AFTERNOON

Malleable roundtable discussion.

Materials Handling

"Monorail Materials and the Foundry," by J. B. Forker, Osborn Mfg. Co., Cleveland.

"Materials Handling for Miscellaneous Castings," by F. D. Campbell, Eastern Corp., New York.

"Materials Handling in the Small Brass Foundry," by D. G. Anderson and B. F. McAuley, Western Electric Co., Chicago.

Shop Courses

Joint Session with American Society of Mechanical Engineers

Gray iron founding—Session 4.
Nonferrous founding—Session 3.

Friday, May 6

Plant visitations.

Mechanical Engineers Schedule Three-M Congress with Foundry Convention

SPONSORED by its management, maintenance and materials handling divisions, the American Society of Mechanical Engineers is holding its Three-M congress in Detroit, May 4-5. Headquarters are to be at Hotel Statler.

The congress, held in Cleveland last year, was scheduled for Detroit during this particular week through cooperation of the American Foundrymen's association and the Materials Handling institute, both of which are conducting meetings in that city at that time, using Hotel Statler as headquarters.

A feature of the Three-M congress program will be a waste elimination symposium on the morning of May 5, with five phases of the subject to be presented in technical papers. The concluding technical session on the afternoon of the same day, devoted to materials handling, will be a joint meeting with the American Foundrymen's association.

The following tentative program has been announced:

Wednesday, May 4

MORNING

"Maintenance of Materials Handling Equipment," by T. A. Bissell, associate editor, *Maintenance Engineering*, New York.

"Relative Wear of Metals by Abrasion," by C. R. Weiss, chief engineer, Link-Belt Co., Indianapolis.

"Management Policies and Practices in a Continuous Production Gray Iron Foundry," by W. G. Reichert, foundry engineer, Singer Mfg. Co., Elizabethport, N. J.

AFTERNOON

Inspection trip to Ford Motor Co.

EVENING

A. S. M. E. dinner at Detroit Yacht club.

Thursday, May 5

MORNING

Management and Materials Handling

"Plant Layout by Products Instead of by Parts," by Louis Berg, manager of manufacture, A. C. Spark Plug Co., Flint, Mich.

Waste Elimination Symposium

"Elimination of Waste in the Foundry," by E. S. Carman, construction engineer, Cleveland.

"Weekly Accounting of Waste," by S. K. Cooper, Johns-Manville Co., manager of inspection and control department, Manville, N. J.

"Maintaining Interest in Suggestion Systems," by Prof. W. E. Fisher, University of Pennsylvania, Philadelphia.

"Savings by Substitution of Other Materials," by George Bangs, Nassau Smelting & Refining Co., New York.

"Common Savings in Shop Wastes," by C. B. Hall, stores manager, Pennsylvania Railroad Co., Philadelphia.

Continuous showing of motion pictures and stereopticon views of materials handling by members of Materials Handling institute.

NOON

Luncheon discussion on export trade and economic control.

AFTERNOON

Management

"Knowledge of Markets and Its Effect on Product Design," by R. F. Elder, assistant professor of marketing, Massachusetts Institute of Technology, Cambridge, Mass.

"Man-Hour Analysis of Productivity of Industry, as Revealed by Unusual Data Gathered by Census Bureau," by L. P. Alford, Ronald Press, New York, and J. E. Hannum, director, Engineering Index, New York.

Materials Handling

Joint session with American Foundrymen's association

"Monorail Materials Handling and the Foundry," by J. B. Forker, Osborn Mfg. Co., Cleveland.

"Materials Handling for Miscellaneous Castings," by F. D. Campbell, Eastern Corp., New York.

"Materials Handling in the Small Brass Foundry," by D. G. Anderson and B. F. McAuley, Western Electric Co., Chicago.

EVENING

Buffet dinner and smoker.

Cleans Blast Furnace Gas In a Single Washer

Wet cleaning of blast furnace gas in a single washer to blast furnace stove and gas engine efficiency has been developed to the point where installation of equipment in blast furnace gas main systems now is feasible. Details of the design and operation of this new-type cleaner were explained at a symposium on mechanical, combustion and electrical developments in the iron and steel industry held by the combustion engineering division of the Association of Iron and Steel Electrical Engineers in Youngstown, O., March 24.

In discussing improvements in sheet mill practice, one speaker mentioned that sheet mills equipped with continuous pair and pack heating furnaces and mechanical feeder and catcher tables now are capable of producing 27-gage sheets, 120 x 29 inches, at the rate of 30 to 40 tons per mill per 8-hour turn, compared with a 10-ton output of hand mills, and at a saving of about $5 a ton. Last year 26 sheet mills in this country were equipped with mechanical feeder and catcher tables.

Improvements in mechanical equipment for sheet mills were made so rapidly during the past two years, according to an electrical engineer, that of 23 control systems installed in 10 plants, no two installations are similar. Contactors and relays for operating feeder and catcher tables must make from 1 to 1¼ million operations per month per mill, and in many cases over 12 months' service without replacement was reported.

Widespread interest centered around the discussion of the development of alternating-current motors for actuating the mechanical tables and one manufacturer mentioned that this type motor now is being built to reverse 40 times a minute.

THE POINT WHERE PROFITS BEGIN

When sales outstrip production by a wide margin, the point where profits begin doesn't seem particularly vital. Prices are so high at such times that wasteful production costs do not receive the close attention they deserve.

When sales lag, the point where profits begin is something that we all study diligently. And then we find that this important point is somewhere within our own production costs—that we actually can begin to profit before we reach our market.

The right lubrication system and the right lubricants give profits a "head start." In Alemite's many studies of production costs through the years, it has been found that Alemite Lubrication Systems PLUS Alemite Special Lubricants save up to 80% of Breakdown and Repair Bills, 60% of Lubricants and Lubrication time, a large percentage of power loss due to friction drag and other gratifying percentages of saving all along the production line.

For a factual survey of possible savings through lubrication in your own establishment, under your own operating conditions, made free and without obligation to you, mail the attached coupon—TODAY!

Alemite Corporation (Division of Stewart-Warner) (576)
2680 N. Crawford Avenue, Chicago

We surely are interested in all possible savings through efficient lubrication.

Name _____

Address _____

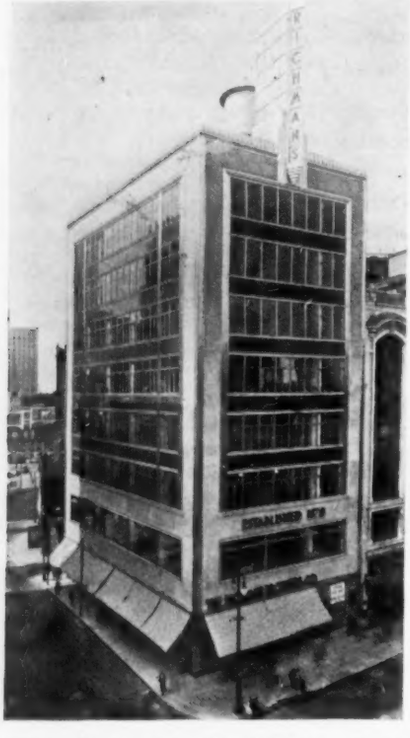
PIONEERS IN SPECIALIZED LUBRICATION FOR INDUSTRY

Chrome-Nickel Steel Trim Has Concrete Backing

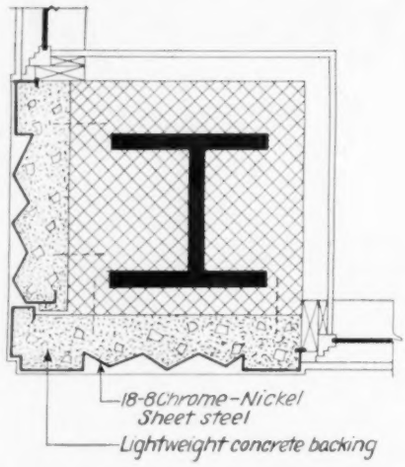
CORROSION-RESISTING steel of the 18-8 chrome-nickel analysis has had fairly wide application in exterior building trim, many of the newer metropolitan skyscrapers employing the material for mullions, spandrels, window trim, etc. In these installations, the steel, in the form of polished sheets, is bolted or welded to the building framework and is not intended to carry any of the load.

In construction of two new stores of the Richman Bros. Co. in Detroit and Pittsburgh, however, an exterior finish of corrosion-resisting steel is applied in a new way. The 18-8 steel is intimately combined with a concrete backing aggregate and the composite steel and concrete units, known as Macotta and manufactured by The Maul Co. Inc. of Illinois, Detroit and Chicago, provide insulating and fireproofing as well as load-bearing qualities.

Referring to the illustration of the Detroit store, all the exterior metal is of 18-8 chrome-nickel steel including the store fronts and the illuminated sign. Vertical members extending from the granite base course to the coping or cresting, vertical members extending from the third floor window level to the top of the eighth floor windows, including the horizontal member at the top of the eighth floor windows, as well as all sills, lintels and mullions between the windows are of the Macotta construction. Spandrels are of black polished granite while the balance of the job is of buff colored Kasota stone.



All vertical and horizontal trim effects on this Detroit building are of the combination steel and concrete design



Detail of section through corner members of the Detroit installation. Note how the steel sheet is anchored into the concrete backing at the sides

The steel is Enduro KA2 chrome-nickel type, with Tampico brush finish, supplied by Republic Steel Corp., Youngstown, O. The Maul company had the contract for furnishing the units complete and ready to set into the wall, and was responsible for all detailing of the job. Steel sheets, 24-gage, were shipped to the plant of the Murray Body Corp., Detroit, for bending into form, and then were transferred to the plant of the Maul company from which the units were delivered to the installation.

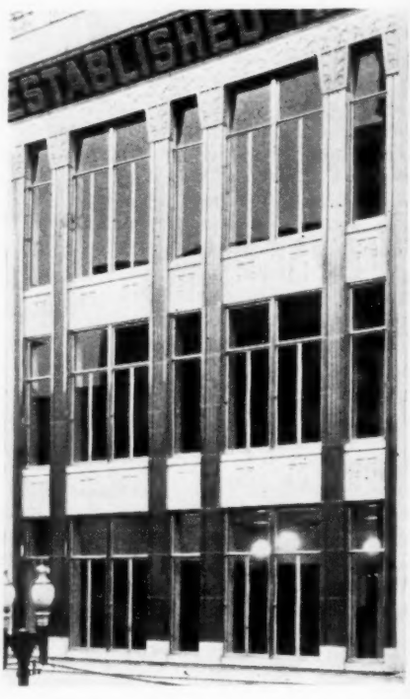
Steel Fitted Into Mold

In preparation of the combination steel and concrete units the sheets were put through a pickling or passivating treatment and all surfaces covered with heavy paper to protect them from marring and scratching. The formed pieces then were placed in a mold where they were securely held in place by special templets so as to remove any twist and warp in the metal, and to insure obtaining the proper and uniform contour of the specified shape and form. The latter operation is said to be the most important in the entire process. Facilities and methods employed are the results of much experimental work, the company states.

Before applying the concrete to the formed sections of metal, steel anchors were welded to the inner side of the steel sheets, and the entire back of the metal coated with a mastic compound, applied to serve as a binder and waterproof material between the metal and the concrete.

The concrete load-bearing backing consisted of a mixture of portland cement and Haydite aggregate which was placed to the proper thickness, generally 4 or 5 inches, and after setting was cured carefully before shipment. The aggregate used is a concreting material manufactured by burning clay or shale in such a manner that it is expanded, resulting in a light, high-strength material with unusual insulating and fireproofing qualities. Concrete made with this aggregate weighs only 100 pounds per cubic foot, compared with 150 pounds per cubic foot for ordinary concrete. This light weight factor results in easier handling, both through the shop and on the job, and also reduces the dead load to be carried by the building foundations or structural members.

When ready for delivery each unit is numbered in accordance with a setting diagram furnished the contractor. The units are delivered to the job as required and the paper protection previously applied to the metal eliminates ordinary hazards encountered in erection. The metal and concrete units are set into the walls in exactly the same manner as

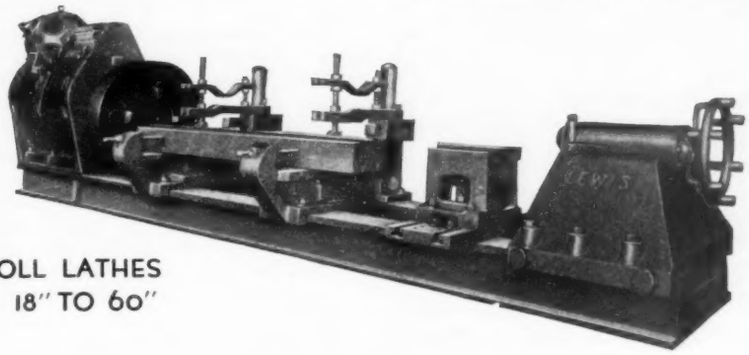


Partial view of the front of the Pittsburgh installation showing mullions of chrome-nickel steel and concrete units

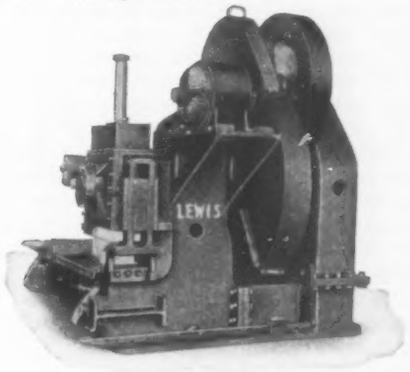
LEWIS

MAKES: Chilled iron and iron alloy rolls --- Cut herringbone gears and gear drives --- Worm gear units---Rolling Mills for Strip Steel, Merchant Bars, Sheet and Tin Plate and All Ferrous Metals --- Shears --- Roll Lathes --- Rolling Mill Machinery --- Neal Patent Reel for Cold Strip Reel --- Special Machinery

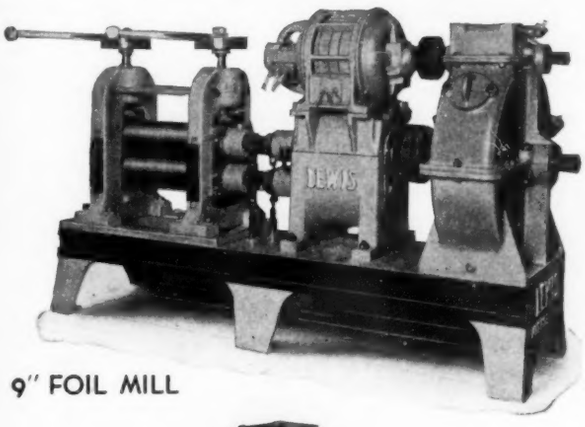
WE WILL BE GLAD TO FURNISH SPECIFIC DETAILED INFORMATION ON ANY OF THESE PRODUCTS. SPECIFICATIONS AND PLANS ON REQUEST.



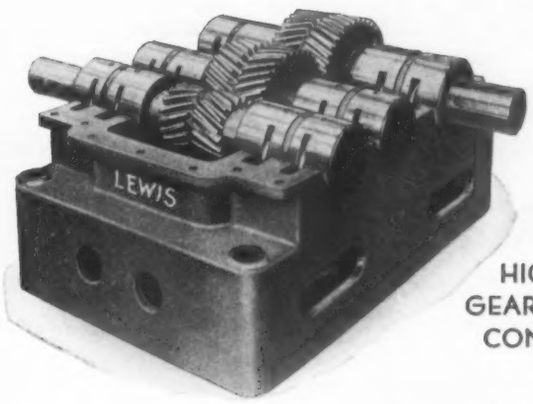
ROLL LATHES
18" TO 60"



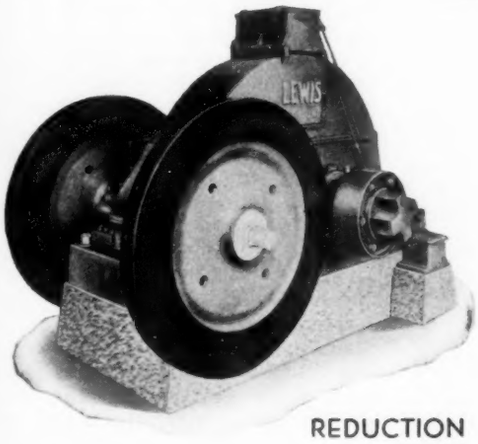
4" x 4" BAR SHEAR



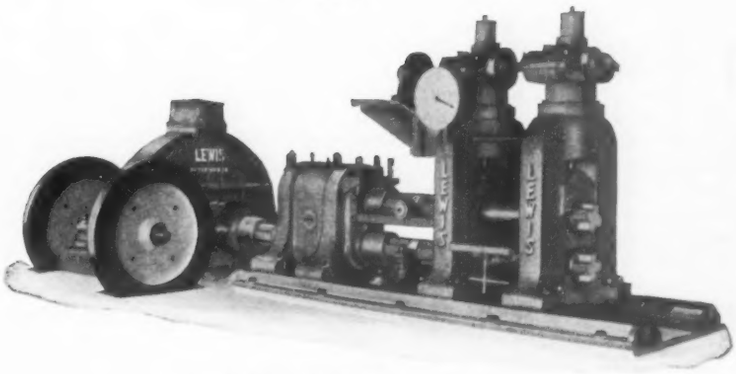
9" FOIL MILL



HIGH SPEED
GEAR SET FOR
CONTINUOUS
ROD MILL



REDUCTION
DRIVE



20" BREAKDOWN MILL

LEWIS FOUNDRY & MACHINE COMPANY

P. O. BOX 1591 PITTSBURGH, PA.

cut stone, hooks for metal anchors being cast into each unit. The surface paper covering is left in place until the exterior walls are finished completely.

The units are laid up with a 3/16-inch mortar joint. For the horizontal joints at the top and bottom of each unit the metal and concrete backing are flush, the special binder between the metal and concrete preventing the possibility of moisture working in between them in the event that some moisture does penetrate the mortar joint. The same is true of the vertical joints at the sides of each unit excepting that the steel is bent at right angles with the face and extends back into the wall about 1 inch, where it is bent again at right angles and imbedded into the concrete to serve as an additional anchor. The units are laid up in standard lime and cement mortar but the joints are racked out on the face to a depth of ¾-inch, this trough being filled with an elastic compound, making the joints flush with the face of the wall.

This method of construction is claimed to eliminate any possibility of moisture condensing on the reverse side of the steel sheet, a condition which may exist where a hollow space is left behind the metal, with the result that with accompanying changes of temperature, condensed moisture runs down the back of the sheet, and with the ordinary type of lap joint seeps through and drips down the face of the wall. Grime and soot in the moisture thereby are left on the polished surface and a stained appearance may result.

Furthermore, with the steel and concrete construction effective means are provided for removing the natural twist and warp of the metal and for keeping it in proper alignment in erection. Danger of denting the metal also is minimized since it is backed up solidly.

The Detroit installation is at the northwest corner of Woodward avenue and Clifford street. Architect was Albert Kahn Inc.; general contractor the Otto Misch Co., both of Detroit. Owner of the site is the Whitney Realty Corp. Ltd.

Similar construction was adopted for mullions on the Richman store in Pittsburgh, as shown in the second illustration. Allegheny metal sheets were used, supplied by Allegheny Steel Corp., Brackenridge, Pa.

The Maul company makes other metalized building units by spraying molten metal on concrete aggregate backing. Attempts have been made to spray molten chrome-nickel steel in this manner, but this work still is confined to the development stage.

Soldered Joints in Corrosion-Resisting Steel Require Strengthening

BY V. W. WHITMER

Welding Engineer, Republic Steel Corp., Massillon, O.

IN SOLDERING any metal it should be remembered that such a joint is one of surface adhesion only and is not an alloy of one metal with another metal, nor is it a homogeneous mass, such as a weld or fusion. Rough surfaces on the metal present numerous fingers or projections which give the solder something to hold to; while hard, smooth or polished surfaces supply no means for anchorage and consequently such joints may be weak.

Hard, stiff materials, if deformed after soldering, will place more strain on the joint, as it will probably be the softer of the two materials, and rupture may occur. Soft materials such as copper will bend easily after soldering since the joint is just as strong as the sheet, if not more so. In the latter instance failure is infrequent.

Since corrosion-resisting steel is one of the stiff metals, it is necessary to make the joint mechanically strong in itself if any particular load is to be carried. Joints therefore should be lock-seamed, riveted, or otherwise strengthened, depending upon the solder primarily as a seal, or in some cases, a fillet.

In soldering such joints, if smooth or polished sheets are used, the edges first should be roughened with a coarse file or emery wheel. If this is impossible, a mixture of 50 parts ferric chloride in 100 parts muriatic acid and diluted two or three to one should be applied to the surface with an acid swab and allowed to set for 10 or 15 minutes. The mixture then should be removed carefully so that it will not touch elsewhere on the sheet. This procedure etches the surface sufficiently for tinning.

This preliminary treatment is unnecessary in the case of rough pickled sheets, which require only the application of a good soldering flux and tinning the edges with a commercial half-and-half solder. After tinning, excess solder should be wiped off, leaving only a fairly thin film. In the case of a lock seam both sides of each piece should be tinned. When the joint has been tinned, it should be lock-seamed, riveted or properly strengthened and, using the flux or cut acid, then sweated with more solder, in the same way as if working tin, terne or any other tinned product.

Larger Iron Better

No precautions need be taken with the soldering irons other than those employed in everyday practice. In view of this, a larger iron will be beneficial, as it will supply more heat for running a longer seam without the detrimental effects from warping caused by too high a temperature. If special analysis solders are required, such as 60-40 or even block tin, the same procedure should be followed. To avoid warping or buckling the irons should not be hotter than necessary.

After completion of the work, all the joints and preferably the entire job should be washed with a solution of soap and 5-10 per cent soda to neutralize any acid which may still be present. If not removed, the acid may cause small pits and etchings, especially on polished sheets. Finally the soldered joint should be rinsed with clean water and wiped dry with a soft cloth.

Steel Founders' Society To Meet in New York

The Steel Founders' Society of America Inc. will conduct its spring meeting at the Roosevelt hotel, New York, May 18, the day preceding the spring meeting of the American Iron and Steel institute, and will consider as a major topic "deflationary buying and destructive selling" and its effect on general business.

Another discussion will center on "The Cost of Dust in the Steel Industry," with Clarence B. Bartlett, industrial analyst, Milwaukee, scheduled to speak on this subject.

Special committee meetings are planned, including those of the joint cost committe and joint technical committe. On May 19, the heat-corrosion resistant alloy founders' division, composed of producers of high alloy castings, will hold its regular meeting. This group will consider adoption of standard analysis specifications, adoption of code of ethical trade practices, adoption of uniform guarantee, adoption of a uniform method for arriving at the cost of metal, and development of engineering standards.

PRECISION WELDING

—NOW MUREX CONTROL MAKES IT POSSIBLE

Give a welder a Murex Electrode and you give him a new control over welding which banishes old uncertainties and makes welding a dependable, *precision* operation. ¶ A Murex Electrode doesn't "pass the buck" to the operator, and as soon as he strikes an arc with Murex, the difference is apparent. The arc is quiet, almost noiseless, held short with ease by "riding" the electrode on the work. There are no objectionable fumes or smoke. Vaporization and spattering are negligible. There is a steady, maximum deposit of strong, ductile metal in a smooth bead or a clean, round fillet, free from undercutting. ¶ It's the heavy, all-mineral coating on Murex which makes the difference. And that coating, which is held fast to the core by a patented asbestos spiral winding, is proof against moisture and shock. It is not injured when the electrode is bent. Under the arc, the coating creates a free-flowing, visible slag which blankets, levels, and protects the deposit, and which chips off as easily as a thin film of glass. ¶ Murex Electrodes are made 18 inches long in a variety of types . . . for welding commercial mild steel, manganese steel, 18-8 stainless, and other metals. Write for complete information.

METAL & THERMIT CORPORATION

120 BROADWAY, NEW YORK, N. Y. · ALBANY · PITTSBURGH · CHICAGO · SOUTH SAN FRANCISCO

MUREX

HEAVY MINERAL COATED ELECTRODES

Murex Electrodes are made in the United States by the American Murex Corp. and are sold only by the Metal & Thermit Corp., pioneers of welding and manufacturers of Thermit. Literature on Thermit welding for many kinds of heavy work sent on request.

New Books Worth Reading

SCIENCE ◆ ECONOMICS ◆ BUSINESS

Steel and Alloys Were Faraday's First Research

Faraday and His Metallurgical Researches, by Sir Robert A. Hadfield; cloth, 329 pages, 6 x 9½ inches; 68 plates, 12 illustrations and 27 tables; published by Chapman & Hall, London, distributed in America by The Penton Publishing Co., Cleveland; price $6.50 postpaid.

From 1819 to 1824, before he had discovered the action of electromagnetic induction, Michael Faraday devoted much of his time to metallurgical research. Uutilizing the primitive laboratory facilities of the Royal Institution at London and with the assistance of friendly steelmakers in Sheffield, he experimented with steel alloyed with nickel, silver, platinum, rhodium, iridium and osmium, palladium, titanium, copper, tin and gold. Until recently comparatively little was known of this phase of Faraday's work. Fortunately, however, a box containing 79 specimens of his steel was discovered and turned over to Sir Robert Hadfield, who has examined them by the methods of modern scientific research. Using only a pound and a quarter of the precious material, Sir Robert made 493 chemical analyses and conducted chemical, physical and mechanical tests to the number of 866.

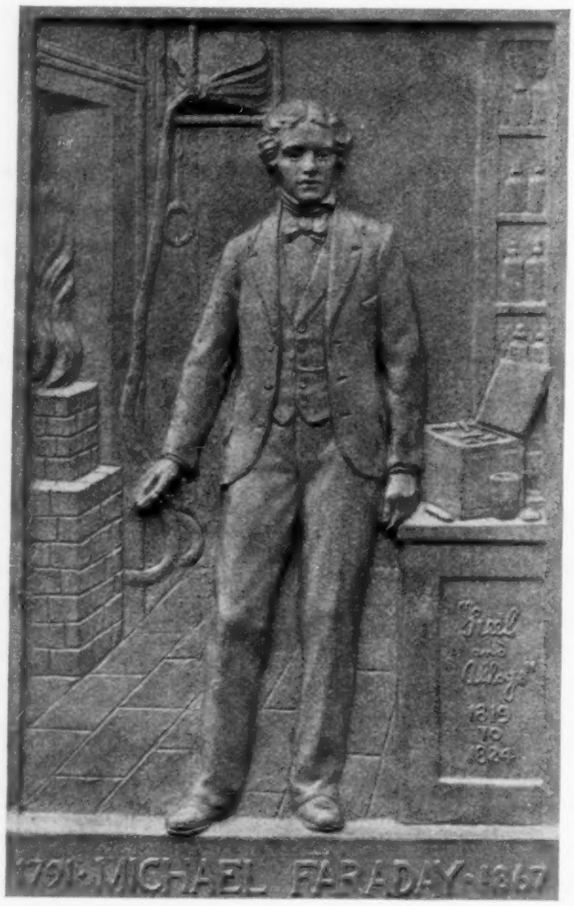
Out of the results of this unusual examination of century-old steels, Sir Robert has developed material for a book of absorbing interest. Entitled, "Faraday and His Metallurgical Researches," it not only throws light on an obscure part of Faraday's eventful life but also establishes the "Father of Electricity" as the rightful holder of the additional honor, "Pioneer of Alloy Steels."

In view of the author's own notable achievements in the discovery of alloy steels, it is easy to understand the enthusiasm with which he has delved into hidden nooks and crannies to unearth evidence of Faraday's researches. He traces Faraday's rise to fame, leaving no stone unturned in seeking out early acquaintances and associations that may have influenced the direction of the great scientist's search for knowledge. Thus he sets the stage for Faraday's exploits, and introduces a *dramatis personae* embracing many notable figures.

He reviews the earliest beginnings of metallurgy and traces its development up to the nineteenth century. After describing in great detail his examination of the historic specimens, Sir Robert then presents numerous appreciations of Faraday's work, concluding with his own judicial appraisal, which needless to say, gives great credit to the subject of the book.

In conclusion, the author deals with more recent developments in alloy steels. The book is intensely interesting from beginning to end. It is rich in historic incidents of significance in the world of science. It is illustrated profusely and contains many tables of data relating to the author's tests of Faraday's steels.

While Sir Robert set out primarily to establish Faraday as the first to engage in systematic research concerning the preparation of alloys of steel, his book goes far beyond that objective. It affords the reader a rich background for a better appreciation of the importance of genuine and successful research—the search for and discovery of fresh knowledge. The proceeds of the sale of Sir Robert's book will be devoted to the funds of the Royal Institution to be used for furtherance of metallurgical science.



Plaque modeled by F. J. Halnon, R.B.S., and cast in steel. Faraday's blast furnace is shown at the left and his famous box of 79 specimens on the table at the right

◆

Story of the Metals Told in Popular Style

The Book of Metals, by Donald Wilhelm; cloth, 341 pages, 6 x 9¼ inches; published by Harper & Bros., New York; supplied by STEEL, Cleveland, for $4, plus 15 cents for postage; in Europe by Penton Publishing Co. Ltd.; Caxton House, London.

Answering the questions of his two sons, 14 and 16 years of age, suggested the plan of this volume and the author proceeded to tell in simple style the story of all the metals, to answer the questions of those with curiosity and no means of appeasing.

It is not the work of the author unsupported, but its authenticity is buttressed by the careful scrutiny of leaders and specialists in knowledge of the metals. It is not a technical book and the writer disclaims being a metallurgist. For this reason he has had the assistance of some 35 advisers to give exactness to his statements.

The effort has been to give with scientific accuracy the history, mining, alloying of the metals, phrased in language understandable by those with no previous knowledge. It is designed also for those interested in learning the most recent achievements in the science of metals. The pages are full of the romance of the metals, side glances into the interesting byways that border the path of the tremendous development of the past few dec-

ades when most progress has been made in these fields. Anecdotes of men and metals are used with effect to illustrate the points.

Much attention is given the subject of alloy steels and the resulting new metals, in effect, which have resulted from this research and the benefits they have bestowed on civilization in strength, in beauty and in general utility.

No person with an interest in metals can fail to increase his knowledge greatly by perusal of this volume, gaining new information without effort at concentration or deep study of the sort usually needed in reading metallurgy.

Corrosion-Resisting Steel Milk Truck Tank Withstands Price War Bombing

BOMBING of a loaded 2000-gallon metal milk truck tank during a price war in a southern city recently resulted in some damage to the truck but the welded corrosion-resisting steel tank remained intact and no milk was lost.

A package of dynamite had been placed on the left rear end of the can rack of the month-old tank and the explosion tore off the aluminum and cork covering, broke one crossmember supporting the tank, blew out two tires and broke windows in the cab 35 feet ahead.

The tank was full of milk at the time and most significantly revealed great strength. Where the dynamite exploded, the tank was bulged in, thus reducing its capacity and creating an inside pressure sufficient to blow the manhole cover with its two aluminum cross arms about 20 feet. No leaks developed and after being reinsulated and covered with aluminum, the truck resumed service without missing a trip.

The explosion demonstrated the strength of the welds in the tank, for the impact occurred at one of the welds. Construction using butt strap reinforcement is used and this may have helped to prevent rupture.

Manufacturer of the tank was the Heil Co., Milwaukee, and the material used was Rezistal KA2 corrosion-resisting steel produced by the Crucible Steel Co. of America, New York.

NO NEED to cry over spilt milk! Although this 2000-gallon milk truck tank was bombed, the welded steel tank was only bulged in and not a drop of milk was lost

Porcelain Enamel Group Schedules Meeting

Porcelain Enamel institute's second annual meeting will be held Thursday, May 26, at Hotel Cleveland in Cleveland. A program to include discussions under the direction of the industry's leaders is being constructed around the theme: "The Possibilities of Porcelain Enamel in New and Old Markets." The meeting is open to every one interested in the use of porcelain enamel. Headquarters of the institute are at 612 North Michigan avenue, Chicago.

Committee Announces Plans For Metal Research

Announcement is made by the joint research committee on the effect of temperature on the properties of metals, organized by the American Society of Mechanical Engineers and American Society for Testing Materials, of the completion of plans for sponsored researches during the present year at the engineering experiment station of the University of Illinois, Urbana, Ill., and at Battelle Memorial institute, Columbus, O.

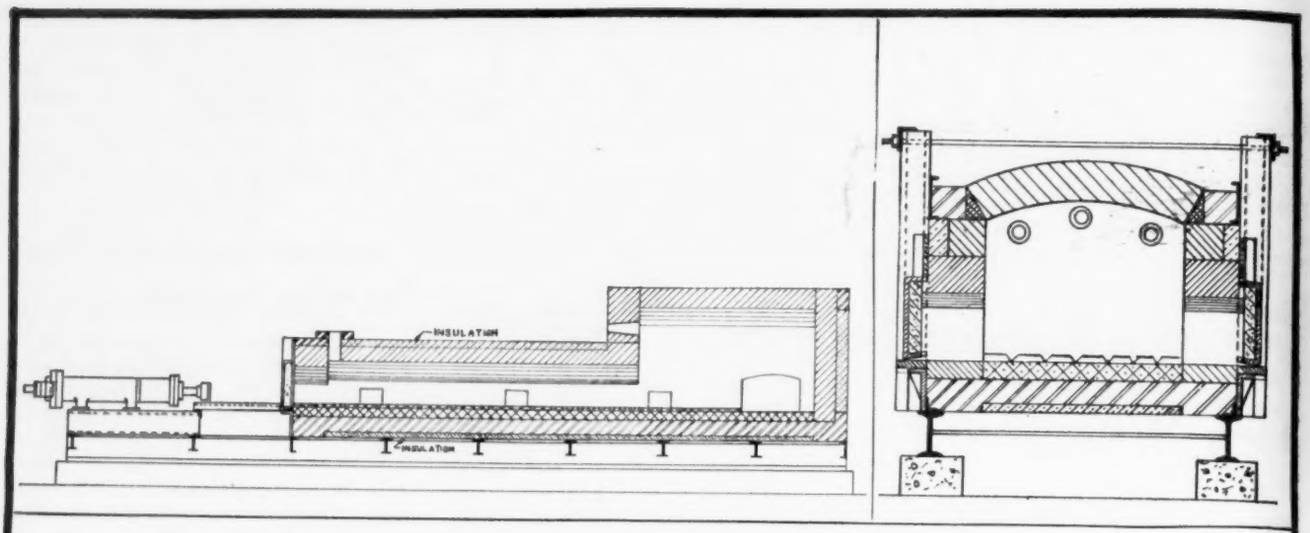
Contributions and pledges so far made cover only about half of the $20,000 needed for the proposed three-year research program of the committee, but funds already made available by the Engineering foundation, the National Electric Light association, the American Petroleum institute, the National Research council and a group of alloy castings manufacturers through the corrosion resistant alloy founders' division of the Steel Founders' Society of America Inc., have made it possible to initiate activities and to continue work throughout the calendar year.

Work at the University of Illinois, under Prof. H. F. Moore, will relate largely to the endurance properties of austenitic chrome-nickel steels at different temperatures. This will be co-ordinated with creep tests being made at the Battelle institute under direction of Dr. H. W. Gillett, as well as with studies at various industrial laboratories relating to the structural stability of these steels.

Publishes Flange Standards

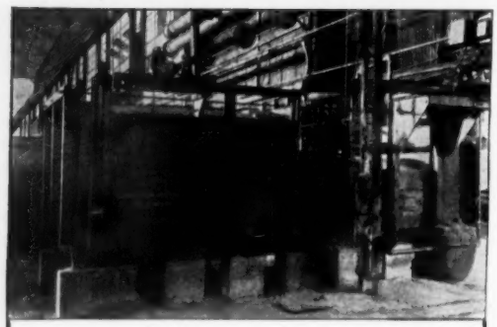
American Standards association announces the publication by the American Society of Mechanical Engineers of the American standard for cast-iron pipe flanges and flanged fittings for maximum nonshock working hydraulic pressure of 800 pounds per square inch (gage) at ordinary air temperatures.

The standard was prepared by the committee on pipe flanges and fittings under the sponsorship of the American Society of Mechanical Engineers, the Heating and Piping Contractors National association, and the Manufacturers Standardization Society of the Valve and Fittings Industry. Copies are available from the American Standards association, 29 West Thirty-ninth street, New York.



PUSHER TYPE CONTINUOUS FORGING FURNACE
COSTELLO ENGINEERING COMPANY

DESIGN + INSULATION
makes furnace efficiency...



WHERE INSULATING BRICK PROMOTE EFFICIENCY

Combustion engineers find that Armstrong's and Nonpareil Insulating Brick effect a distinct fuel saving in furnace installations. Both are machine-sized to an unusual degree of accuracy. They lay up easier, with a tighter, more efficient insulating wall. Both are often laid up dry—a saving in time and labor. Their salvage value is exceptionally high.

Armstrong's Insulating Brick are burned at Cone 14, proof that they withstand temperatures up to 2500° F. behind the refractory. Nonpareil Insulating Brick are safely used up to 1600° F. also behind the refractory. Prompt shipment can be made in any quantity from Beaver Falls, Pa. in all standard fire brick sizes, and special shapes to order. Fifteen thousand brick constitute a carload.

says COSTELLO ENGINEER

MR. A. V. RITTS, Chief Engineer of the Costello Engineering Company of Pittsburgh, writes as follows concerning the new Costello Continuous Pusher Type Furnace:

"There are several advantages that this furnace has over the ordinary forging furnace:

"1. It is continuous in its operation—small billets are charged in the back and are advanced through the furnace by means of a hydraulic pusher.

"2. It is equipped with luminous flame burners, the fuel being natural gas. This method of combustion, along with the design of the furnace and the insulation used, makes it very efficient. We have heated steel to a forging temperature with approximately three fourths of a cubic foot of gas per pound of steel heated."

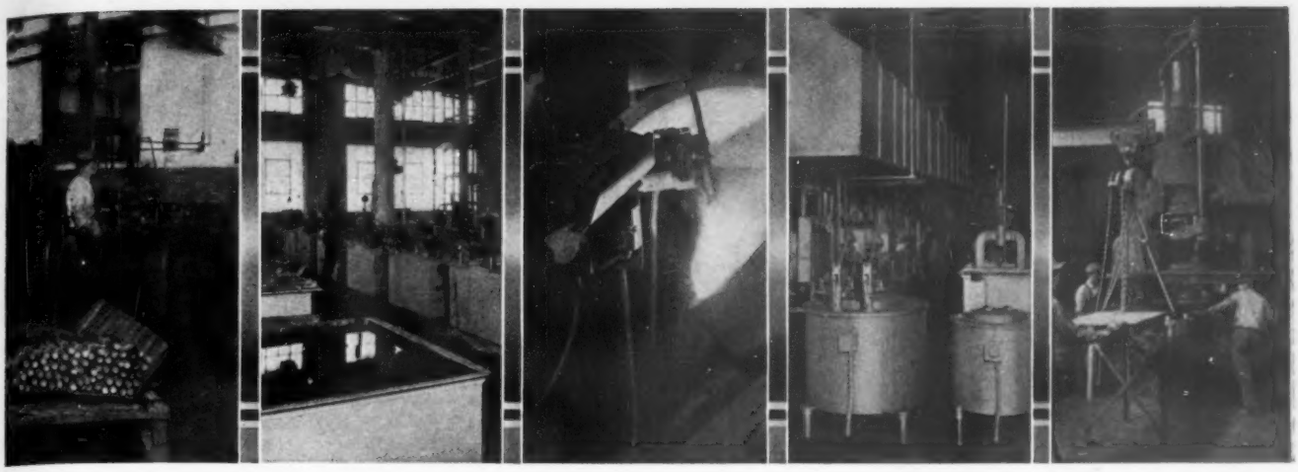
Due to improvement of furnace design by furnace builders, insulation plays a prominent part in operation of modern equipment.

The insulation used on this and other Costello furnaces is Armstrong's and Nonpareil Insulating Brick. Sample bricks and descriptive literature will gladly be sent on request. Address Armstrong Cork & Insulation Company, 920 Concord Street, Lancaster, Penna.

Armstrong's (A) *Product*

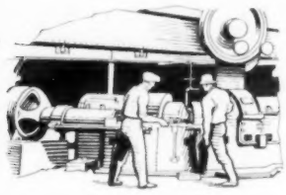
Armstrong's and Nonpareil Insulating Brick

FOR FURNACES, BOILERS, KILNS, AND LEHRS



MAKING THE MOST OF STEEL

A MANUFACTURER of hard rubber lined steel pickling tanks employs a bond between the rubber and the steel which does not deteriorate at temperatures as high as 212 degrees Fahr. While this temperature is higher than the usual temperatures in pickling, the company has a special application which has been operating regularly at this temperature. This is a 10-inch diameter steel pipe lined with hard rubber, which is employed in the refining of hydrochloric acid.



EXPERIENCE has revealed to a fabricator of spun 18-8 chrome-nickel commodities that spinning tools made of nickel-chromium cast iron, heat treated to maximum hardness, give long life. The metal for this purpose should contain 3 per cent carbon, 2.50 to 3.00 per cent nickel, 0.75 to 1.00 per cent chromium and 1.20 to 1.50 per cent silicon.

$ $ $

Contrary to common conception, stainless steel cutlery is not more sensitive to heat and cold and to strong sunlight and darkness than is ordinary steel; neither is temper affected by its remaining in water.

$ $ $

Fine cracks in metal too small to be seen with the naked eye can be detected by cleaning the surface and painting it with a thin mixture of red lead and gasoline. The gasoline evaporates leaving the red lead on the surface and this is wiped off with a dry cloth. When the surface is examined with a magnifying glass, cracks show up as thin red streaks.

$ $ $

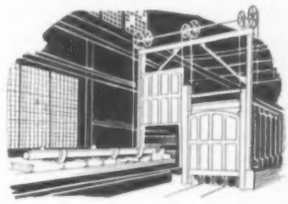
The stethoscope, long used by physicians, now is being applied for the nondestructive testing of welds. The instrument is provided with a rubber tip to exclude extraneous sounds and to give contact on the irregular surface plates, tanks, pressure vessels or pipe, as well as to minimize damping of the oscillations at the contact of stethoscope and metal. The steel is struck with a small hammer at the spot to be tested. Lack of fusion, particularly at the bottom of a vee or along the scarf, gives a characteristic reedy, high-pitched initial note. When the defect is serious, it has a damping effect on the total sound, so that its presence is evident in the after ring.

$ $ $

Engineers affiliated with the scientific and industrial research division of Great Britain have discovered if the leaves of steel springs, such as those used in automobiles and trains, are machined and polished separately, the complete spring assembly will be from 20 to 50 per cent stronger than a spring of similar dimensions in which the leaves are left in their forged state.

$ $ $

The time required to unload a 60-ton car of high grade sheets has been decreased from 2 to 3 hours to 15 to 20 minutes and the former cost of $7 to $8 lowered to 60 to 70 cents by a large consumer in Detroit by the use of a crane and carrier. A waster sheet is placed on the top and bottom of each 10-ton bundle before it is strapped and wrapped at the mill. Three 2-inch bands are fastened around the bundle from end to end and three from side to side. Each bundle then is wrapped securely in a special paper made by pressing together two sheets with a double layer of asphaltum between in which tough java sisal fibers are imbedded. The paper is so tough that it scarcely can be torn. Bundles are loaded lengthwise or sidewise in open-top cars, depending upon the length of the stock shipped. Lengthwise loading is preferable with pieces of 2 x 4-inch lumber between piles to prevent shifting of the stock while in transit.



AT A TOOL steel plant in the East a novel method is used to effect the cooling cycle of the heat treating operation. The heat treating furnace is electrically heated and is capable of taking a charge of 50 tons of alloy and high-carbon steel in the form of bar stock 25 feet long. The unit has a removable cover extending the full length. As a means of accelerating the cooling portion of the cycle, pipes of heat-resisting alloy extend across the underside of the cover and are connected to a duct system. A blower is arranged to blow air through the pipes, thus extracting heat from the furnace chamber without admitting air to the chamber itself. This arrangement gives comparatively rapid cooling without excessive oxidation of the charge.

$ $ $

A new product of steel is a heavy porcelain cover which may be placed over the burners of the kitchen stove when not in use or used as a mixing board on the kitchen table. The manufacturer produces them in four sizes and three colors.

Scanning the Technology of Steel

A Digest of Important Developments in Scientific Research, Engineering Progress and Operating Procedure Pertaining to the Production, Processing, Application and Performance of Steel

Tool Heat Treatment

Electric furnaces used in production of tools, by M. E. Dorner, in Electrical Production, March, 1932, p. 6, 3 pp., 5 illusts.

Production of quality tools demands proper heat treatment which in turn implies adequate means for controlling furnace atmosphere in order to prevent scaling, oxidation and decarburization of the surface of the tools. A manufacturer of cutters and reamers recently installed two electric furnaces in the tool hardening room and noted considerable improvement in the heat treated work. Close tolerances are maintained, production has been increased 20 to 50 per cent, losses due to faulty heat treatment have been eliminated largely, and more uniform hardness of the product is being maintained.

Each furnace is equipped with atmospheric control, provided by a gas curtain across the opening of the furnace. The pressure of this curtain is said to be sufficient to prevent admission of outside atmosphere and the volume large enough to displace all oxygen previously present in the heating chamber.

—STEEL, 4-4-32

Synchronous Motors

Reversing synchronous motor drives for metal rolling mills, by E. T. Petrik, in Iron and Steel Engineer, March, 1932, p. 117, 5 pp., 13 illusts.

Application of a synchronous motor to a hot copper reversing mill is described and the advantages and disadvantages of this type of drive for other types of rolling mills are considered. In comparison with the direct-current drive, including the necessary motor-generator set, the first cost of the synchronous drive is appreciably lower. Floor space is less. Operating cost shows considerable savings because of higher electrical efficiency. Maintenance expense is lower and reliability should be greater due to simplicity of motor and control equipment.

Against these apparent advantages must be conceded the real advantage of the direct-current drive which comes from flexibility of speed control, faster reversals, ability to start the pass before the motor has accelerated to top speed, etc. It is not suggested that the synchronous motor is ready for general application to reversing stands in steel mills; however, it is believed that there will be some reversing drives where the conditions of mill operation, plant layout, etc., are such that the synchronous motor may be best adapted.

—STEEL, 4-4-32

Lubrication

Measured lubrication and its application to various types of industrial machinery, in Lubrication, published by the Texas Co., March, 1932, p. 25, 11½ pp., 11 illusts.

Determination of the lubricating requirements of any piece of machinery entails not only knowledge of machine design, but also familarity with operating conditions, along with an understanding of the lubricant characteristics and methods of application. If carried out in an intelligent manner certain definite results are attainable, of which reduced maintenance costs, maximum production and insurance of positive functioning of machinery are outstanding.

At the present time the mechanical force-feed lubricator, along with the utilization of centralized pressure have become adopted extensively where positive lubrication, economy, cleanliness and insurance against accumulation of nonlubricating matter around moving parts are essential. Automatic lubrication aids materially in the operation of mass production machinery since as far as possible the human factor is eliminated in actual application. Furthermore, hazards to operators in manual lubrication of high-speed machinery are overcome. A number of types of force-feed lubricators and centralized pressure systems are discussed in detail.

—STEEL, 4-4-32

Welding on Bridges

Altering and repairing steel and wrought iron bridges by welding, by Frank P. McKibben, in Journal of the American Welding society, March, 1932, p. 21, 5 pp., 9 illusts.

Influences which make alterations or repairs necessary on steel and iron bridges include corrosion, cracks due to overloading or to defective metal, excessive stresses, readjustment of existing members, etc. Although welding will not solve all the bridge engineer's problems, many opportunities arise in altering wrought iron or steel highway or railway bridges where the welding method is well adapted.

In general the work to be welded should be the positive and the electrode the negative side of the circuit. Corroded iron or steel should be cleaned thoroughly of dirt, rust and paint; and if corrosion has proceeded to the point of leaving thin edges on angles or other similar parts, the thin portions should be removed till adequate thickness is reached whereon welding may be applied. Care should be exercised to secure good penetration of the weld metal into the parts welded.

A number of changes made in bridges by welding are detailed by means of diagrams. On the whole, railroad companies have been much more favorably inclined toward the use of welding than have state highway departments. It is important in doing welding work on bridges that only capable welders be employed. All operators should be tested at the beginning of the work to ascertain their fitness; and, if the project be of sufficient magnitude to warrant, those employed should also be tested at intervals during the progress of the work.

—STEEL, 4-4-32

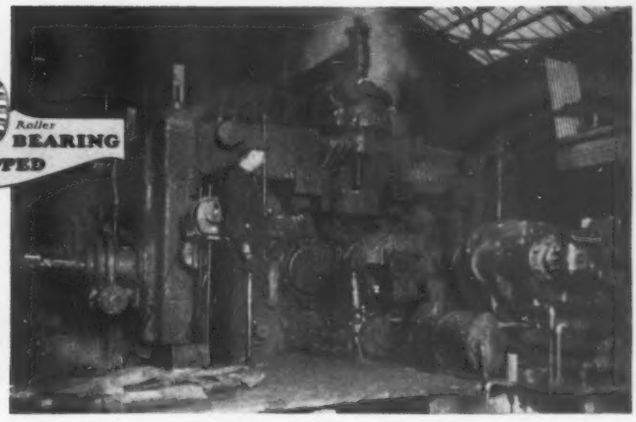
Superhardening

Magnetic superhardening and stabilization of metals, by Edward G. Herbert, in American Machinist, March 24, 1932, p. 21, 3½ pp., 9 illusts.

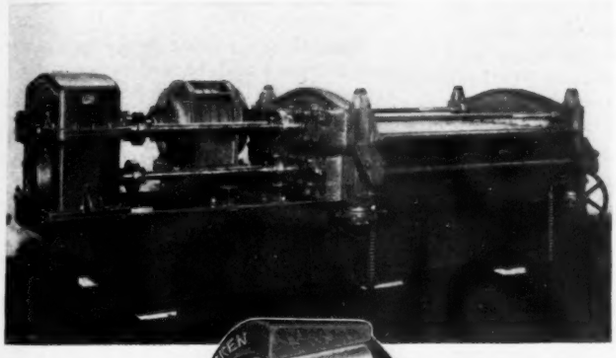
The author develops a new theory of magnetic stabilization of metals at hardness levels considerably in excess of that induced by quenching or work hardening. The procedure involves a second magnetic treatment to stabilize the superhardness induced in the steel by the first such treatment.

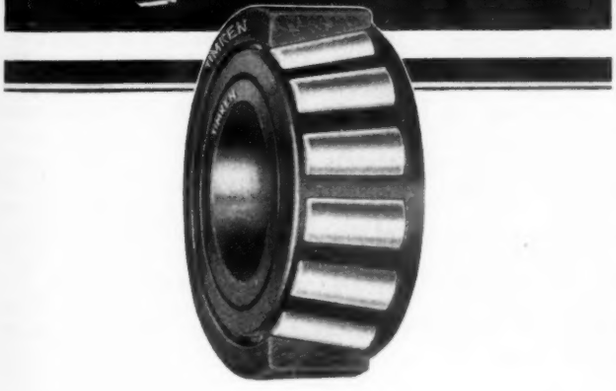
Practical results for the shop man are seen in that cutting tools of many types and shapes may be superhardened at slight expense in equipment and labor, and small wearing surfaces of machinery can be made more satisfactory, probably permitting the substitution of lower grade materials.

—STEEL, 4-4-32



Because nothing but proved performance counts, Aetna-Standard uses Timkens





Aetna-Standard Engineering Company knows that it cannot afford to take chances with unproved bearings in its modern seamless tube machines and plate and sheet levelling equipment. Neither can the operator.

So to their own tested designs, Aetna-Standard engineers add the proved performance of Timken Heavy Duty Mill Type Bearings.

Three outstanding results are accomplished. Power demands are lowered from 30 to 50%. Dependability is fully secured. Maintenance cost is cut to the bone.

Comparable advantages cannot be obtained with other types of bearings because (1) Timken is the only type of bearing geometrically designed to carry all radial and thrust loads within itself. (2) It is the only type of bearing that can be set up with extremely close radial running clearance, and held to that clearance permanently. Timken Bearings do not require take up any more frequently than a "non take up" bearing has to be replaced. The life of the Timken Bearing is thus much longer.

It will pay you to endorse the builders' judgment when buying any type of steel mill machinery. Specify Timken-equipped. The Timken Roller Bearing Company, Canton, Ohio.

Users of Aetna-Standard Timken-equipped plate and sheet levellers and seamless tube mills:

The Babcock & Wilcox Tube Company, Great Lakes Steel Company, Illinois Steel Company, Inland Steel Company, Seneca Iron and Steel Company, Tennessee Coal and Iron and Railway Company, Timken Steel and Tube Company.

TIMKEN *Tapered Roller* **BEARINGS**

Photo, American Flyer Mfg. Co.

More than 5000 tons of steel is consumed annually in the manufacture of miniature wind-up, electrical and steam-driven miniature trains, and tracks

Large Uses of Steel In Small Ways

214th Article ◆ Miniature Trains

PRODUCTION of miniature trains is no longer merely a seasonal industry. as manufacturers start on regular schedules after inventory early in the year that carry through to the following Christmas. Consumption of steel for the trains and equipment in recent years has approximated 5300 tons annually.

The trains fall into three major classifications, wind-up and narrow and wide-gage electrical. The wind-up units constitute only about 25 per cent of the output, as electrical trains now are produced at less cost than formerly.

Variety of Materials

Among the materials used are tin and terne plate, full-finished autobody sheets, cold-rolled strip, silicon steel electrical sheet, enameled steel, cold-rolled flat steel wire, lithographed steel sheets, steel pinion and drill rod, steel screws, nuts and rivets, piano wire springs; zinc, lead and tin-base die castings; a large amount of other nonferrous products, and also some small gray iron castings, the latter only for the wind-up trains. Castings are supplied by jobbing foundries.

Of the metal products, about 80 per cent by weight is steel, and the remainder iron castings and nonferrous metals, which include phosphor bronze spring sheets, coils and rod; brass sheets, coils and rod; seamless tubing; brass eyelets; brass screws and nuts, and etched brass name plates.

Lithographed blanks of tin mill black sheets, 0.012 to 0.022-inch thick, form the wind-up train car bodies. The larger car bodies and the electric and steam-type locomotives are made of No. 20 gage and lighter sheets. Tin plate, 0.015-inch thick is used for the tracks and sleepers.

Electrical sheet steel, 0.75 to 1.25 per cent silicon, is used in fields and armatures, while coil cores are made of a large number of laminations for low power loss, low heating and smooth operations. No. 19 gage cold-rolled strip forms many of the motor parts.

Motor drive wheels are zinc-base die castings, with nickel plated, heat-treated cold-rolled strip steel tires pressed into place. Axles are of drill rod, ¼-inch and smaller, the drive being through a gear train. The gears are hobbed on watchmaking machinery.

On some models a strip steel cam and gear mechanism synchronizes a gong in the motor with the swinging of a dummy bell controlled by a piano wire spring. Clockwork gears and sides of the wind-up trains are cold-rolled strip.

Some parts require as many as 50 operations of blanking, piercing and cut-off dies. The various steps of forming, assembling and packing, for both wind-up and electrical trains, are on one conveyor line. A leading manufacturer, the American Flyer Mfg. Co., Chicago, assembles as many as 14,000 cars a day, and with an automatic punch press blanks wheels for cars and locomotives at the rate of 225,000 per day.

Metal for the car and locomotive bodies in the shearing department either is cut to size or the strips are blanked in multiples of structural bodies, permitting staggered cutting to save scrap. The metal first is fed through a press which blanks out one to three cars from each sheet, windows being blanked in the same operation.

Body Electric Welded

The first step in forming the bodies is by a press which bends up the ends of the sheets. In two to three more press operations the car body's details are formed, and the sheets go to a battery of portable electric welders where many of the parts are fastened together.

Before final assembly and testing the finishes are applied in the paint department. Finishes usually are two coats of dipped and baked black japan with gilt trim. The gilt is applied with hand spray guns. Locomotives are sprayed with enamel and the enamel baked.

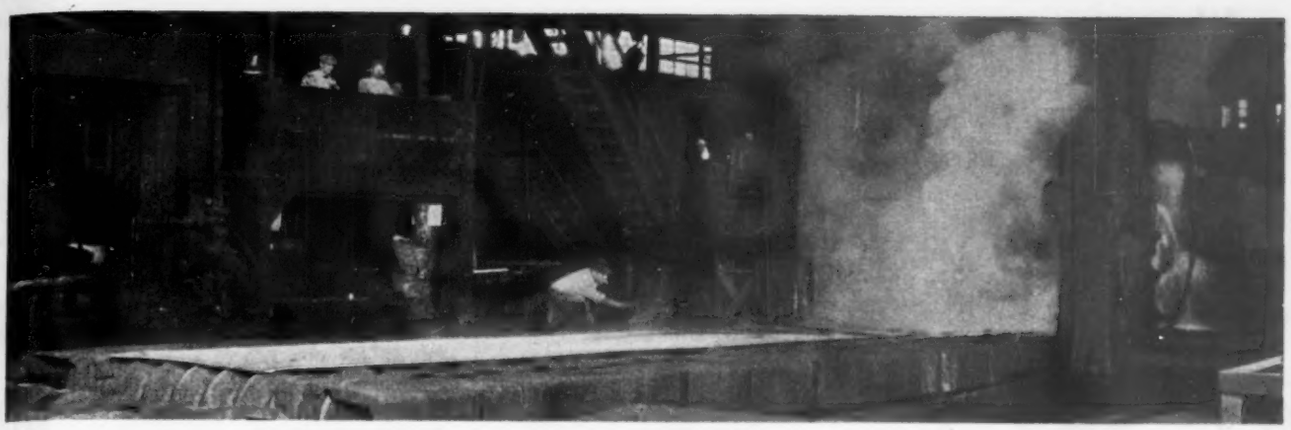
Tracks and sleepers are made of tin plate, and are clipped together in standard sections. A punch press with numerous fingers bends the prongs to tie the dozen pieces that make up cross-over tracks, the fingers being beveled at the working ends so as to form the prongs gradually, and give them a final clamping action.

Designs are copied from originals, and sleeping and parlor cars actually are reduced to scale from their counterparts.

Publishes Proceedings of Coal Conference

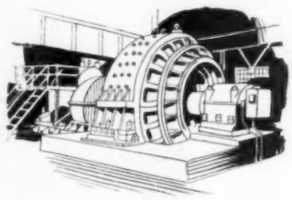
Announcement is made of the publication of the proceedings of the Third International Conference on Bituminous Coal, which was held under the auspices of the Carnegie Institute of Technology, Pittsburgh, in November, 1931. The proceedings, printed in two volumes of approximately 900 pages each, include all papers and discussions delivered at the four-day meeting. Contributions of scientists from Belgium, France, Germany, Holland, Italy, Japan, Roumania, Spain, Sweden, and the U. S. S. R. have been translated into English. Illustrations and graphs have been incorporated in the books.

Of the 98 papers included in the proceedings, 39 were contributed by Americans, 22 by British scientists, 20 by German fuel technologists, and seven by French.



PROGRESS IN STEELMAKING

RECOVERING sulphuric acid from pickling tanks has been effected by European engineers by a 2-stage stirring and cooling process. Circulation of brine causes the iron sulphate to crystallize and when the batch of spent acid is emptied on a sieve, made of chromium-iron, the acid drains through, leaving the sulphate crystals to be retained by the sieve.



AN UNUSUAL application of a squirrel-cage motor is found at the plant of a stripmaker in the Chicago district. The first stand of the company's continuous hot strip mill is driven by a 1000-horsepower motor of this type which is started at reduced voltage obtained by connecting a reactor in the neutral of the motor windings.

♦ ♦ ♦

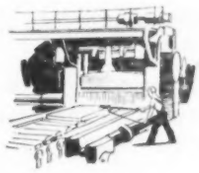
Asphalt is used in many open-hearth shops in Germany as a coating for ingot molds. Coal tar containing benzol used as a mold wash, according to German practice, causes cracked ingots.

♦ ♦ ♦

Automatic control serving a pack heating furnace at a sheet mill in the Detroit district provides a temperature ranging from 1350 to 1370 degrees Fahr. This is accomplished by a thermocouple located in the sidewall of the furnace about 10 feet from the charging end. The thermocouple is connected with a potentiometer which transmits the electromotive forces to a solenoid. When the current from the potentiometer traverses the solenoid, the latter acts in general like a magnet and operates a butterfly valve, thus controlling the amount of air delivered to the burner. The greater the amount of air passed to the burner, the greater the volume of gas aspirated and vice versa. Uniform control thus is effected.

♦ ♦ ♦

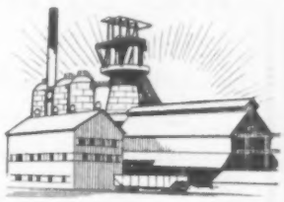
Reducing the heating of ingots from an art to a science is being attempted by an eastern steel company. The maker tends to roll on the cold side and is seeking to set up a practice which will result in the proper heating in the least amount of time and with the least amount of fuel consumption. Pyrometers are being used in the present investigation. A thermocouple is located in the center of the ingot, another on the inside of the ingot and a third on the inside surface of the refractory furnace wall. It is expected the study of the relationship of the temperatures shown by these thermocouples will afford an indication of the factors that will insure correct heating.



SMALL laminations and blisters on firebox plates are disclosed by an effective method employed by the inspection department of a Pennsylvania plate mill. The surface of each plate is marked off into small squares and these are hammer tested for the defects mentioned.

♦ ♦ ♦

Numerous controls for steel mill auxiliaries now can be concentrated within easy reach of a single operator by the recent development of a keyboard type master switch. Incorporated in each unit are forward, reverse and off keys which control actuation through magnetic panels. The combination of keyboard switches, a foot-operated main roll master switch and an automatic screwdown control affords the operation of a reversing blooming mill by one man.



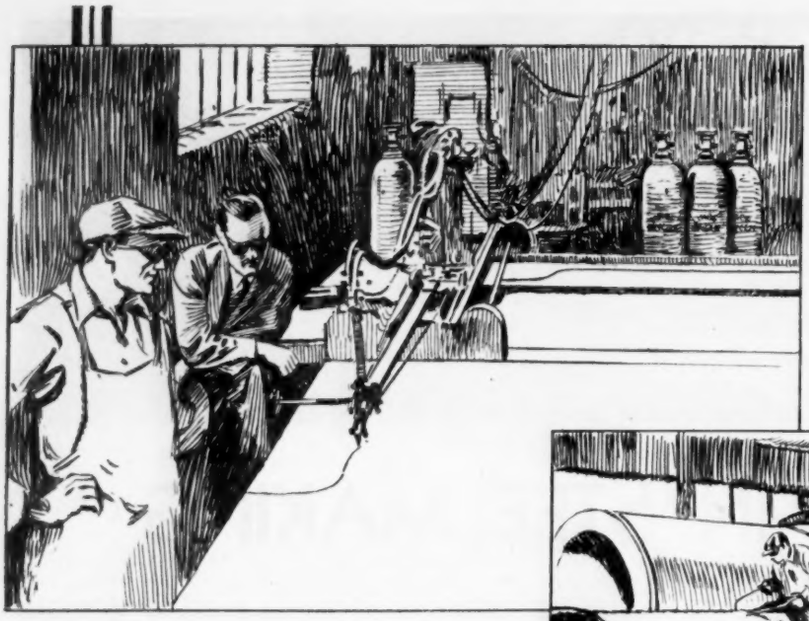
WITHIN recent months a pneumatic control has been introduced by European engineers which simplifies the original design for the simultaneous operation of the gas, air, relief, cold blast and hot blast valves at blast frunaces. Actuating a handwheel a fraction of a turn causes these valves to function automatically, in the proper sequence without loss of time.

♦ ♦ ♦

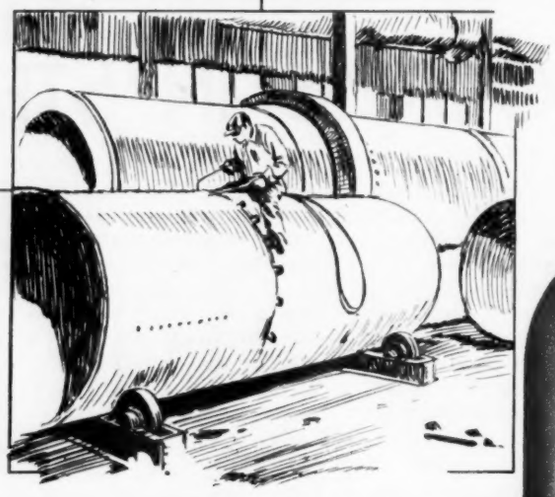
Photoelectric tubes now are used to automatically control the operation of conveyors serving pack heating furnaces. The packs of sheets in transit through the furnace intercept a beam of light which actuates the photoelectric relay and stops the conveyor before the sheets strike the discharge door of the furnace.

♦ ♦ ♦

Turbulent mixing of blast furnace gas now is employed in a recently developed boiler designed with a square combustion chamber and fired tangentially with cleaned gas through tuyeres located at each corner. One such installation is showing an overall efficiency of 80 to 85 per cent.



In shaping and assembly



LINDE PROCESS SERVICE ASSURES EFFECTIVE USE OF OXWELDING AND CUTTING

LINDE Process Service offers you every facility for the most effective use of oxy-acetylene welding and cutting. In the shaping or assembly of metal products this service will supplement the work of your own engineers in organizing your welding and cutting operations for maximum speed, economy and dependability. It places at your disposal the experience of a quarter century of pioneering the oxy-acetylene process. It helps you inject the best practices of the day toward the solution of your specific problems. For example:

It helped a manufacturer of power squaring shears and forming presses to double production speed, and to effect economies in fabrication and finishing by the use of oxy-acetylene shape-cut steel.

It assisted a furnace manufacturer in establishing assembly procedures for oxy-acetylene welding and securing the economies of a shorter production cycle.

It helped a manufacturer in developing a procedure control for oxwelding pressure vessels for storage of large volumes of materials at pressures up to 300 lb. per sq. in.

These examples, selected from thousands, illustrate the versatility of Linde Process Service. They show why Linde customers gain so much extra value from their use of the oxy-acetylene process. Write or call the nearest Linde District Office.

THE LINDE AIR PRODUCTS COMPANY

Unit of Union Carbide and Carbon Corporation

126 Producing Plants · UCC · 627 Warehouse Stocks

IN CANADA, DOMINION OXYGEN COMPANY, LTD., TORONTO

District Offices

Atlanta	Detroit	New York
Baltimore	El Paso	Philadelphia
Birmingham	Houston	Pittsburgh
Boston	Indianapolis	St. Louis
Buffalo	Kansas City	Salt Lake City
Chicago	Los Angeles	San Francisco
Cleveland	Milwaukee	Seattle
Denver	Minneapolis	Tulsa

LINDE OXYGEN · PREST-O-LITE ACETYLENE · OXWELD APPARATUS AND SUPPLIES · UNION CARBIDE

New Equipment

PRODUCTION FABRICATION TREATMENT FINISHING

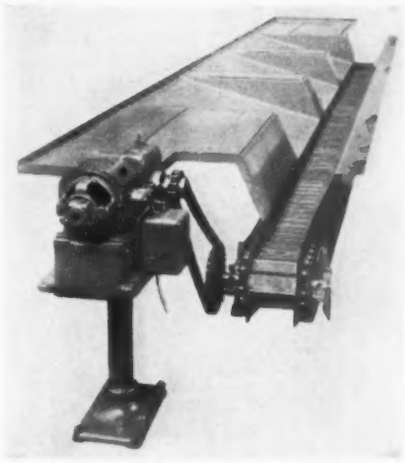
Builds Superpower Lathe To Determine Capacity of Cemented Carbide Tools

FOR the primary purpose of determining the maximum cutting capacities of cemented carbide cutting tools, American Tool Works Co., Cincinnati, recently developed a superpower lathe to be used by General Electric Co., Schenectady, N. Y. To meet the requirements of this work it was essential to incorporate in the design of such a unit a much wider speed range and decidedly greater structural rigidity than was ever before furnished in such a lathe.

Two separate and distinct speed ranges are provided; one, the high speed or direct range, furnishes 70 spindle speeds obtained entirely through the 100 horsepower, direct current, 6 to 1 motor which is mounted on a cast iron pedestal at the end of the lathe, shown in the illustration below, and coupled directly to the lathe spindle by a flexible coupling.

Control of this range of speeds is secured through the usual type of electrical apron control mechanism with the control handwheel located at the right-hand side of the apron, which starts and stops the motor and varies the electrical speeds. The second or back geared range provides the same number of speeds as the direct range.

One of the outstanding and, at the same time, essential features of this head, is the automatic interlock provided for preventing the change from direct to back geared speeds without



Motor-driven chip conveyor developed for superpower lathe

first stopping the motor. This interlock is accomplished through the combination of one mechanical and two solenoid locks which will not release as long as there is current in the motor.

Next in interest from the standpoint of novel design, is the bed which, for purposes of strength and rigidity, is made with a closed top, providing a complex box section, thoroughly ribbed and greatly strengthened by numerous cross girths.

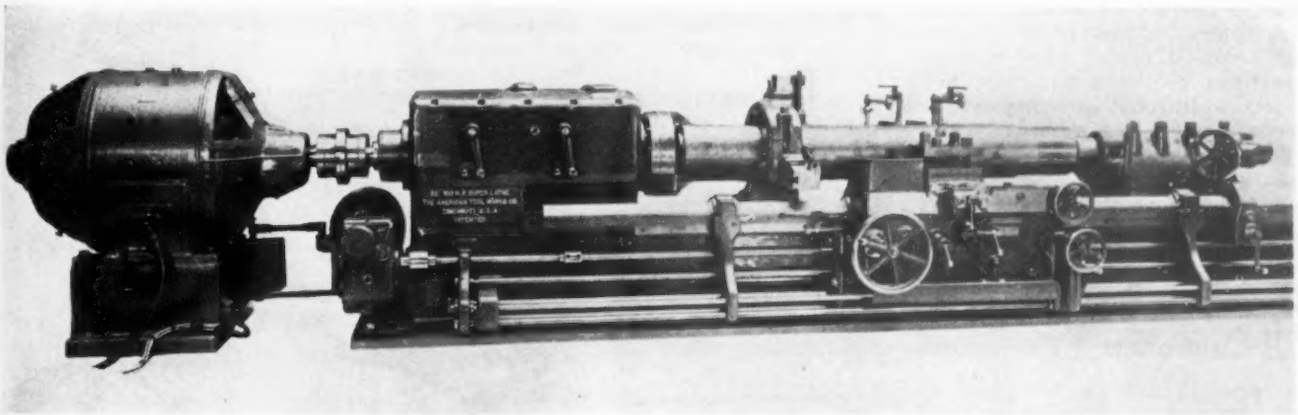
The carriage bears full length on both of the front vees with an auxiliary bearing for side thrust against the vertical wall of the inner vee, while the rear wing has a full-length bearing on the wide flat way at the rear.

The type of tool rests supplied is more or less optional, and depends largely upon the kind of work to be done. The front and rear rests furnished with this particular lathe are massive steel blocks with a 2 x 2½-inch tool capacity. They are provided with four large diameter studs and two heavy steel straps each for holding the tools, while hardened, serrated steel plates are provided for the tool seats.

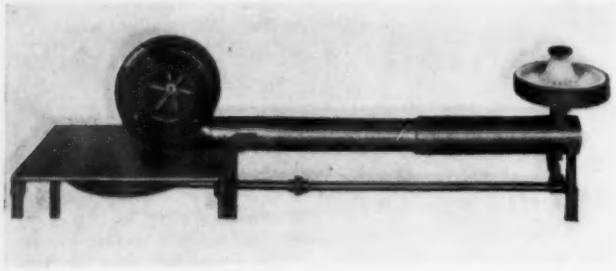
Independent Feed Mechanism

The feed mechanism represents one of the most radical departures from standard lathe design, in that it is entirely separate and functions independently of the lathe spindle. This mechanism is independently driven by a 6 to 1, 3 horsepower, adjustable speed motor located at the headstock end of the bed and through a 50-contact rheostat and a two-speed mechanical unit provides 100 rates of carriage feed, from 1¼ inches per minute to 43½ inches per minute. A handwheel, a revolving pointer and graduated dial control the motor speed and indicate the rate of feed.

To safeguard the operator there has been designed for this powerful lathe a chip breaker and controller, which not only breaks up the chip into small sections, but deflects it as it breaks from the bar into the chip conveyor. This conveyor, shown herewith, operates at a speed of 40 feet per minute and has a capacity of 15 cubic feet per minute. The slope of the bed and



One hundred horsepower lathe developed by American Tool Works Co. to determine capacities of cutting tools



NEW type invisible flame gas burner developed by Burdett Mfg. Co. automatically maintains desired temperature

chip pan directs the chips as they fall directly into the conveyor, which in turn deposits them into the removable collector basket set into the foundation pit at the end of the conveyor.

◆

Invisible Flame Gas Burner Is Automatic

Burdett Mfg. Co., 19 North Sheldon street, Chicago, is producing a new type invisible flame gas burner designed for industrial and domestic use. Pending patents cover the principles of the burner, which is said to consume completely the entire mixture. The burner orifice is never changed, whether natural, mixed, manufactured or hydrocarbon gases are used. The unit produces temperatures to 2800 degrees Fahr.

The burner, shown in the accompanying illustration, is automatic, controlled by thermostat regulating operation. Different kinds of gases may be introduced without turning off the flame. Essentially, the unit consists of a circular cast iron pan, in sizes of from 4½ inches to 20 inches in diameter, in which is placed a refractory concave dish-type disk, slightly smaller than the cast pan so that an aperture of ⅛-inch or more is left between the circumference of the disk and the outer edge of the pan.

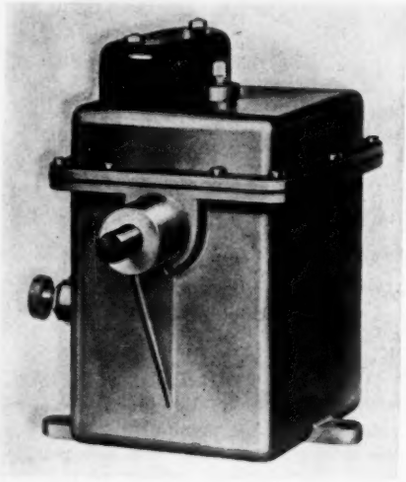
The flame is deflected from a baffle plate made of steel or brass mounted at the top of the nozzle. The baffle may be cone-shaped or flat. The cast pan holding the refractory disk does not become hot even when high temperatures are obtained. The baffle plate, which virtually conceals the flame, also remains relatively cool.

Air is supplied to the nozzle by means of a smaller blower driven by a 1/10-horsepower motor.

◆

Governors Regulate Speed Of Controllers

Barber-Colman Co., Rockford, Ill., recently made the announcement that its damper controllers now may be obtained with speed regulating governors. This governor is simple in design and allows a wide range of speeds to be used. Arranged so that the speed of the controller may be adjusted after installation without opening the controller case, the new unit may be used for a variety of



Barber-Colman damper controller with speed regulator

work on both single and multiple louvred dampers in practically any heating, ventilating, or air conditioning system.

A fractional horsepower induction motor of the shaded-pole type actuates the controller and its governor. This motor has ample power and high starting torque, is small in size and, when properly cooled, may be operated indefinitely under any conditions between no load and stalling load without detrimental effects. The unit is shown in the accompanying illustration.

◆

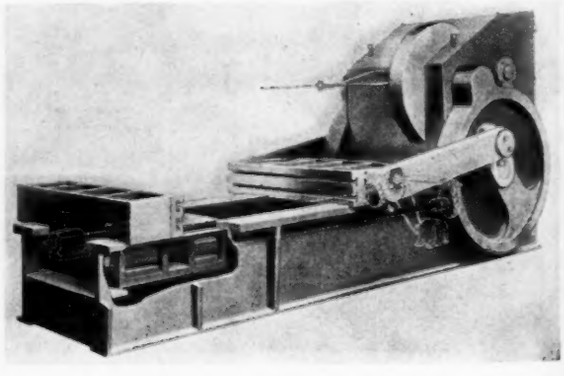
Power-Adjusted Die Holder Feature of Machines

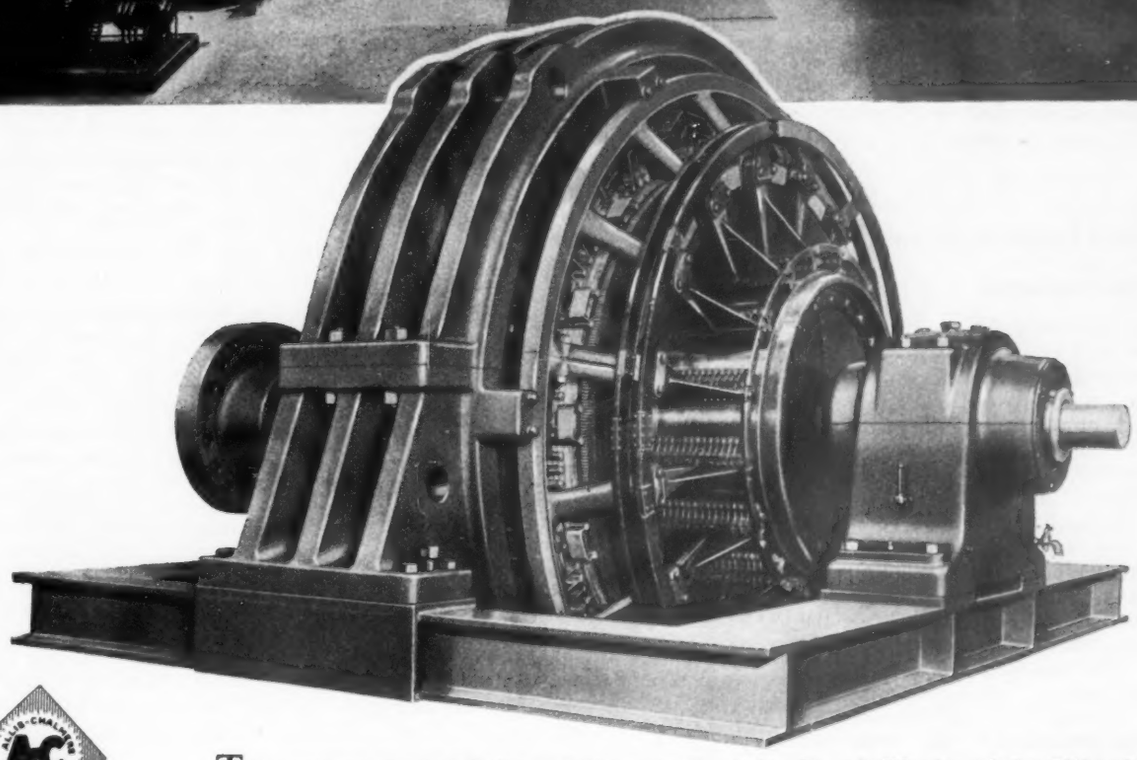
Steelweld Machinery Co., Cleveland, has brought out a new line of bulldozers and bending machines, in which the distinguishing feature is a power-adjusted die holder. For some time this company has been building bulldozers of all-steel construction. It has found, however, that in a great majority of applications, the time of changing and setting up dies is a more important element of cost than the actual bending of work. By the arrangement illustrated herewith, the die holder moves. Bending parts of the dies fastened to the ram and slide are brought together merely by a push-button, in much the same way as the rams of power-operated bending brakes move.

An additional advantage of this arrangement is that the long tie rods which run through to the operating head of the machine, make it impossible to break the tool, as the flywheel, clutch, gears and motor will stall, well before the danger point of stretch is reached. Maximum power of the bulldozer naturally is developed at the point where the crank pins go over the center of movement, or as nearly to this point as can be reached.

The new unit not only has an all steel frame in which the gearing is enclosed, but the main slides are of hardened and ground steel, and the gibs are located underneath the ram in such a manner as to be out of the way of dirt and scale. The gearing and crank arms are of rolled steel; in fact no castings are used in the

THE new line of bulldozers and bending machines developed by Steelweld Machinery Co. is featured by a power-adjusted die holder. Gearing is enclosed in the all-steel frame



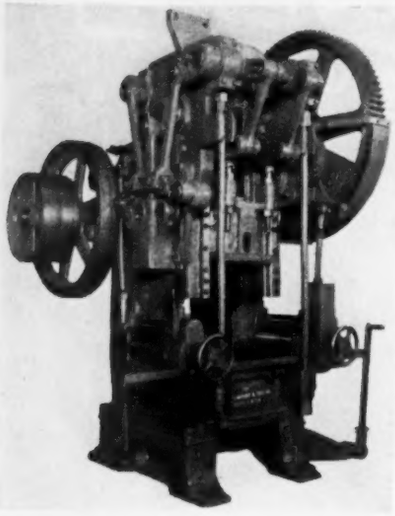


This motor room of the 96″ plate mill at the South Works of the Illinois Steel Company clearly brings out the responsibility accepted by Allis-Chalmers in supplying complete electric drives.

The foreground shows Reyrolle Switchgear for handling all a.c. circuits and liquid slip regulators for the scale breaker and roughing stand drives. In the background are six 3500 h.p. d.c. motors direct connected to individual finishing stands. Synchronous motor-generator sets, switchboards, and control equipment complete the installation.

Allis-Chalmers Mfg. Co., Milwaukee, Wis.

ALLIS-CHALMERS



Toledo press incorporating automatic double roll feed

machine except in Meehanite for the gibs. Crank and ram pins are of heat treated special steel. Flywheel and high speed shaft are mounted on antifriction bearings.

◆

Clutches Embody Many New Design Features

Dings Magnetic Separator Co., Milwaukee, has brought out a new magnetic friction-type clutch designed to provide more power with smaller physical dimensions. The unit has contact faces on both sides of a spring disk, which are compressed between the magnet and armature elements when the coil is energized.

All provisions are made for adjustment to compensate for wear of contact faces. Light springs on the armature holding bolts serve to expel the armature when the coil is de-energized, thus assuring ample clearance between the two clutch elements. The clutch is made with and without ball bearings between the hubs of the two clutch members as installation conditions might require to insure alignment. The company also has brought out a single spring disk clutch following the same general construction given in the foregoing, but having three friction contact faces with the consequent increased torque and power transmission.

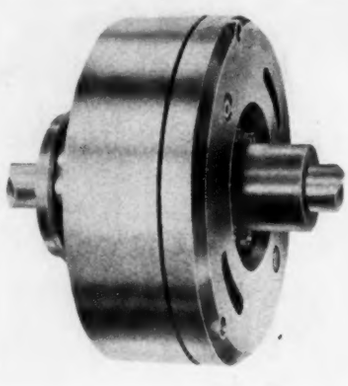
◆

Presses Are Equipped with Automatic Feeds

Toledo Machine & Tool Co., Toledo, O., has developed special automatic double roll feeds for its presses to meet the requirements of intense production of certain stampings and reduce handling to a minimum. From the accompanying illustration it will be noted that the machine proper is a standard double-action toggle drawing and deep stamping press except for the fact that the frame is cut back and heavily reinforced to accommodate the feed mechanism and to permit of feeding the stock from right to left. Tie rods shown give additional rigidity.

The blankholder stroke is 10 inches and the plunger or drawing punch stroke is 16 inches. The press will draw and lift out a shell up to 7½ inches deep. Feed rolls are 18 inches wide, the upper rolls being 4 inches in diameter and the lower rolls 8 inches in diameter on 50-inch centers. They will feed from 5 inches by any increment to 17 inches.

Stock enters the press by means of the set of rolls on the right hand side of the machine. Motion is imparted to these rolls by a reciprocating rack operated by a slotted crank and gearing from the crankshaft with the necessary adjustment for length of feed provided as shown. A cross-rack operates the discharge rolls which are corrugated so as to give a stronger pull on the stock.



Clutch manufactured by Dings Magnetic Separator Co.

◆

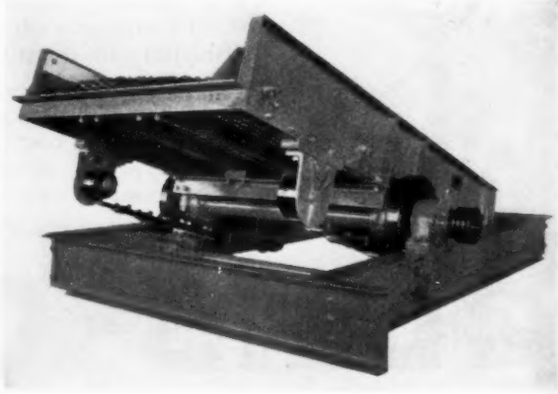
Designs Two New Types of Vibrating Screens

Link-Belt Co., 2045 West Hunting Park avenue, Philadelphia, recently announced two new types of vibrating screens, a positive-drive, heavy-duty unit, and an unbalanced pulley type, heavy-duty vibrating screen. Both are available with either single or multiple decks. A single deck eccentric unit with angle adjustment and special sub frame is shown in the accompanying illustration. These two equipment additions are designed to fill needs where large screen openings are required and heavy capacities must be handled.

In the positive-drive type screen the amplitude of vibration is fixed at the factory, before shipment, to suit the work the screen is to do. Any given amplitude will cover a wide range of screening surface openings. The angle of the screen inclination, speed of operation and direction of rotation, all are changed readily at any time to suit the kind, size and condition of material to be screened.

The unbalanced pulley type heavy-duty screen is designed for high-speed work where the material is of a sticky nature, and on close-sizing problems where the screen openings are not large. The total movement or amplitude of the screen can be varied by the user from zero to about ¼-inch by simply changing the counterweights in the weight containers.

Entire weight of the screen box rests on the cantilever leaf springs. Bearings, method of applying screen cloth, and the cantilever spring design are the same as on the positive-drive type of screen.



SINGLE deck Link-Belt eccentric vibrating screen with angle adjustment and special sub frame. The entire weight of the screen box rests on cantilever leaf springs

Steel Prospects More Encouraging

Industry Sees Some Gains Certain To Result from Automotive Sales Drives—Operating Rate Scheduled for Slight Improvement—March Pig Iron Output Down

A PALL of uncertainty overhanging the steel industry for months appears to have been lifted, at least partially, with the retail automobile sales drive now being made by Ford, General Motors and Chrysler, on which the industry's attention is focused. Steelmakers enter the second quarter in a moderately cheerful frame of mind, convinced some improvement is impending. A number of factors are tending to stimulate automobile sales, not the least of which is the prospective excise tax.

Early this week, on receipt of definite sales reports from "key" cities, Ford will shape up a production program, which will be synchronized with actual demand. Material requirements at the outset probably will be conservative, but even so represent some gain. On hand and partly fabricated are sufficient materials for 50,000 bodies, a carryover from last December when the decision to concentrate on the eight instead of a four was made. At the moment, Ford is releasing a moderate volume of parts business. When Ford buys steel the orders will be distributed widely.

Steelworks operations show considerable resistance to breaking through 23 per cent at which rate they have held for two consecutive weeks. April begins with operations 2 points below the level at the opening of March, but from present schedules it appears this week will register a slight gain, and prospects for improvement are considered much better. For the first quarter, operations averaged 25.6 per cent, compared with 27 per cent in the fourth quarter, and 46 per cent in the first quarter, last year.

Although there were two more operating days in March than in February, pig iron production last month, 958,480 gross tons, was 2070 tons, or 0.2 per cent below that of February. Daily average output dropped 6.6 per cent, from 33,122 tons in February to 30,919 tons in March. Both in total and daily average, March production was the lowest of any month since August, 1921. Output for the three months this year, 2,890,467 tons, represents a loss of 48 per cent compared with the first quarter of 1931. Four fewer furnaces were active March 31 than Feb. 29, bringing the number operating to 60.

British and Dutch pig iron is becoming a more formidable factor in eastern markets, with 15,000 tons entering at Philadelphia. Germans have booked 8000 tons of steel for American importers, and 300,000 tons for Russia. It appears American mills will not participate in the 150,000 tons for the Irak pipe line, the distribution going to French, German and British producers. The Texas Co. is in the market for 75,000 boxes of tin plate for export.

Structural steel projects are more impressive in prospect than in actual awards, which for the week amounted to 9395 tons, compared with 17,000 tons in the week preceding. Four pending projects will require 16,000 tons. Bids are to be called for this summer on 60,000 to 70,000 tons of plates for a tunnel at Hoover dam, Boulder City, Nev. In line pipe practically the only new project of consequence is that for the Southern Counties Gas Co., Los Angeles, bids being taken for 8000 tons. The New Haven has place 10,000 tons of rails.

Producers of heavy finished steel are making a determined effort to obtain the new prices for the second quarter. On flat-rolled products these efforts may be less successful, but producers believe they will at least have the effect of preventing concessions. One large buyer of steel has covered, on the theory that price will go no lower.

STEEL's iron and steel composite is unchanged this week at $29.81; the finished steel composite remains $47.62, but the steelworks scrap composite is down 6 cents to $7.87.

Composite Market Averages

	April 2	March 26	One Month Ago March, 1932	Three Month Ago Jan., 1932	One Year Ago April, 1931	Ten Years Ago April, 1922
Iron and Steel Composite	$29.81	$29.81	$29.61	$29.98	$31.59	$34.42
Finished Steel Composite	47.62	47.62	47.09	47.28	49.22	51.04
Steelworks Scrap Composite	7.87	7.93	7.94	8.03	10.12	13.65

Iron and Steel Composite:—Pig iron, billets, slabs, sheet bars, wire rods, pipe, tin plate, nails, sheets, plates, shapes, bars. Finished Steel Composite:—Plates, shapes, bars, hot strip, nails, tin plate, pipe. Steelworks Scrap Composite:—Melting steel, compressed sheets.

Comparative Prices of Iron, Steel and Coke

Representative Market Figures for Current Week, Last Month, Three Months and One Year Ago

	April 2, 1932	March, 1932	Jan., 1932	April, 1931
PIG IRON				
Bessemer, del., Pittsburgh	$16.76	16.76	17.26	18.26
Basic, valley	15.00	15.00	15.00	17.00
Basic, eastern del., eastern Pa.	15.75	15.75	16.00	17.25
No. 2 foundry, del. Pittsburgh	16.26	16.51	17.26	18.26
No. 2 foundry, Chicago	16.50	16.50	16.50	17.50
*Southern No. 2, Birmingham	11.00	11.00	12.00	13.00
**No. 2X, Virginia furnace	18.00	18.00	18.00	18.25
**No. 2X, Eastern del. Phila.	15.76	15.76	15.76	18.26
Malleable, valley	15.50	15.50	16.00	17.00
Malleable, Chicago	16.50	16.50	16.50	17.50
Lake Superior, charcoal, del. Chi.	23.04	23.04	22.29	27.04
Gray forge, del. Pittsburgh	16.13	16.13	16.63	17.63
Ferromanganese, del. Pittsburgh	80.24	80.24	79.85½	89.79

*1.75-2.25 silicon. For local delivery. Northern shipments based on $10, Birmingham. **2.25-2.75 silicon.

Delivered pig iron prices subject to 10 per cent freight surcharge, maximum 13.44c per gross ton, beginning Jan. 4, 1932.

COKE				
Connellsville, furnace, ovens	2.25	2.25	2.25	2.50
Connellsville foundry, ovens	3.25	3.25	3.25	3.25
SEMIFINISHED MATERIAL				
Sheet bars, open-hearth, Youngs.	26.00	26.00	26.00	30.00
Sheet bars, open-hearth, Pitts.	26.00	26.00	27.50	30.00
Billets, open-hearth, Pittsburgh	27.00	27.00	27.50	30.00
Wire rods, Pittsburgh	37.00	37.00	37.00	36.00

	April 2, 1932	March, 1932	Jan., 1932	April, 1931
FINISHED MATERIAL				
Steel bars, Pittsburgh	1.60	1.55	1.55	1.65
Steel bars, Chicago	1.70	1.70	1.70	1.80
Steel bars, Philadelphia	1.91	1.83	1.81	1.96
Iron bars, Chicago	1.70	1.70	1.60	1.80
Shapes, Pittsburgh	1.60	1.55	1.55	1.65
Shapes, Philadelphia	1.75	1.65	1.65	1.78
Shapes, Chicago	1.70	1.70	1.70	1.80
Tank plates, Pittsburgh	1.60	1.55	1.55	1.65
Tank plates, Philadelphia	1.79½	1.69½	1.69½	1.88½
Tank plates, Chicago	1.70	1.70	1.70	1.80
Sheets, No. 10 blue anneal., Pitts.	1.70	1.70	1.75	1.85
†Sheets, No. 24, hot, ann., Pitts.	2.20	2.20	2.20	2.25
Sheets, No. 24, galvan., Pitts.	2.85	2.80	2.80	2.85
Sheets, No. 10 blue anneal., Chi.	1.85	1.85	2.00	2.05
†Sheets, No. 24, hot, ann., Chi.	2.35	2.35	2.45	2.45
Sheets, No. 24 galvan., Chi.	3.00	3.00	2.95	3.00
Plain wire, Pittsburgh	2.20	2.20	2.20	2.20
Wire nails, Pittsburgh	1.95	1.95	1.95	1.90
Tin plate, per base box, Pitts.	4.75	4.75	4.75	5.00

†Comparisons are with old classification No. 24 black sheets.

SCRAP				
Heavy melting steel, Pitts.	$10.25	10.25	10.25	12.50
Heavy melting steel, eastern Pa.	7.25	7.35	7.50	10.00
Heavy melting steel, Chicago	6.75	6.75	7.25	9.60
No. 1 wrought, eastern Pa.	8.00	9.00	9.35	11.00
No. 1 wrought, Chicago	6.25	6.25	7.25	8.80
Rails for rolling, Chicago	9.50	9.50	10.30	11.85

Sheets

Specifications Heavier As New Prices Go in Effect—Automotive Buyers Continue Cautious

SHEET PRICES, PAGE 59

Youngstown, O.—Sheet mills begin the second quarter with a much more encouraging volume of specifications in hand than at the opening of the first quarter. This strengthens the hope that price advances asked for second quarter will hold. While the Ford Motor Co. and some other automotive builders have not covered requirements for the new quarter, other important automotive interests have done so, with the provision that they be protected against later possible price reductions. The specifications now in hand cover deliveries for April and into May. This has led to a slight expansion in sheet mill operating rates in this district, notably by the Youngstown Sheet & Tube Co. at its Brier Hill and Campbell mills and by the American Sheet & Tin Plate Co. at Farrell, Pa.

New York—Some improvement in jobber specifications features an otherwise dull market in sheets. Prices are holding at the levels announced a few weeks ago. Pennsylvania railroad is to close April 12 on a fair tonnage of miscellaneous sheets.

Bids close April 19 on 115 tons of corrugated steel sheets for the navy, delivery New York and San Francisco.

Philadelphia—Sheet prices are expected to be tested over the next three weeks as mills sound out customers on second quarter requirements. Current trading is light.

Pittsburgh—Sheet business is in unchanged volume and mills so far have not received anticipated orders for automotive use. The upturn in operations of the Ford Motor Co. is expected to be slow and the volume of sheet business is not expected to reach a peak for a number of weeks. Requirements of other sheet consumers are unchanged. Operations hold around 25 per cent and March business was off slightly from the February volume. A better test of prices is looked for with the beginning of the new quarter and expiration of lower price contracts. The market is fairly steady at 2.20c, Pittsburgh, for hot-rolled annealed sheets and 2.85c for galvanized.

Cleveland—Sheet production and consumption are quiet. With two large factors shut down, Otis Steel Co.'s sheet mills and Fisher Body Co.'s stamping and body fabricating division, little sheet stock is moving. The Fisher shutdown is said to be effective for most of April. Prices continue to vary widely. Several interests are firm on new inquiries.

Buffalo—Sheetmakers are much encouraged over the outlook for sales to the automotive trade. However, operations have not increased as rapidly as some had hoped.

Cincinnati—In some miscellaneous lines improvement is noted by sheet mills. In general, inventories are being held to the minimum, with mill production not much changed.

Chicago—Sheet buying continues on the improved basis of the last three weeks. Seasonal activity is more evident in sheets than most other steel products. Small container manufacturers are doing well in specifications, and production of refrigerators continues with little change. Roofing products demand from the Southwest is fair but not up to expectations. Further second quarter contracts have been made at existing prices. Mill prices for recent sales of No. 24 hot-rolled annealed have been at 2.30c. No. 24 galvanized are 2.95c, mills.

Birmingham, Ala.—Operations of sheet mills are under 20 per cent. Small industries are purchasing. The drum division of the Ingalls Iron Works Co. here is operating almost at capacity but new steel requirements are light.

Current Finished Steel Prices

Delivered prices subject to freight surcharge corrected to nearest ½c. Asterisk denotes price change this week

Steel Sheets

HOT ROLLED No. 10
(24 to 48 inches wide)

Pittsburgh, base	1.55c
Gary, Ind. Harbor, base	1.65c
Chicago, del.	1.70c
New York, del.	1.90c
Birmingham, base	1.70c
Philadelphia, del.	1.86c

BLUE ANNEALED NO. 9-10

Pittsburgh, base	1.70c
Chicago, district mills	1.80c
Chicago, delivered	1.85c
Philadelphia, del.	2.01c
New York, del.	2.05c
St. Louis, delivered	2.07½c
Birmingham	1.85c
San Francisco c.i.f.	2.30c

HOT ROLLED ANNEALED NO. 24

Pittsburgh, base	2.20c
Gary, Ind. Harbor, base	2.30c
Chicago, del.	2.35c
New York, del.	2.55c
Philadelphia, del.	2.51c
Birmingham, base	2.35c
St. Louis, del.	2.57½c
San Francisco, c.i.f.	2.80c

GALVANIZED NO. 24

Pittsburgh, base	2.85c
Gary, Ind. Harbor, base	2.95c
Chicago, del.	3.00c
Philadelphia, del.	3.16c
Birmingham, base	3.00c
St. Louis, del.	3.22½c
San Francisco, c.i.f.	3.45c

AUTOMOBILE NO. 20

Pittsburgh, base	2.80c to 2.90c

FURNITURE

Pitts., No. 10 heavy	2.65c
Pitts., No. 20 light	3.15c

TIN MILL BLACK NO. 28

Pittsburgh, base	2.40c to 2.50c
Gary, base	2.50c to 2.60c
St. Louis, del.	2.77½c to 2.82½c

HEAVY COLD ROLLED NO. 10

Pittsburgh, base	2.25c
Gary, Ind. Harbor, base	2.25c to 2.35c
Chicago, del.	2.30c to 2.40c
Philadelphia, del.	2.56c
New York, del.	2.60c
St. Louis, del.	2.62½c

COLD ROLLED NO. 20

Pittsburgh, base	2.75c
Gary, Ind. Harbor, base	2.75c to 2.85c
Chicago, del.	2.80c to 2.90c
Philadelphia, del.	3.06c
New York, del.	3.10c
St. Louis, del.	3.12½c

TIN AND TERNE PLATE
Per 100-pound box, Pittsburgh

Tin plate, coke base	$4.75
Long ternes, 24, unassort	3.00c

Gary, Ind., base 10 cents higher

Wire Products

(Prices apply on straight carloads. Mixed and joint carloads take 10 cents higher price; pool carloads 25-cent advance; less carloads 40-cent advance.)
F.o.b. mills, 100 lb. keg

Standard wire nails	$1.95
Cement coated nails	1.95
Galvanized nails	3.95
(Per pound)	
Polished staples	2.50c
Galvanized staples	2.75c
Barbed wire, gal.	2.60c
Annealed fence wire	2.35c
Galvanized wire	2.80c
Woven wire fencing, (9-11 ga.)	$55.00
(12½ ga. and lighter)	$60.00
(To Manufacturing Trade)	
Plain wire, 6-9 gage	2.20c
Spring wire	3.20c

Chicago and Anderson, Ind., $1 over Pitts.-Cleve.; Duluth and Worcester, $2 higher; Fairfield, Ala., $3 higher.

Steel Plates

*Pittsburgh, base	1.60c
*Philadelphia, del.	1.79½
New York, delivered	1.80c to 1.90c
Boston, delivered	1.92c to 2.02c
Chicago, base	1.70c
Cleveland, del.	1.70½c to 1.75½c
*Lackawanna, N. Y., base	1.70c
Birmingham, Ala., base	1.65c to 1.75c
*Coatesville, Pa., base	1.70c
Pacific Coast, c.i.f.	1.80c
St. Louis, del.	1.97½c

Structural Shapes

*Pittsburgh, base	1.60c
*Philadelphia, del.	1.75c
New York, del.	1.77c to 1.87c
Boston, del.	1.90½c to 2.00½c
Chicago, base	1.70c
Cleveland, del.	1.70½c to 1.75½c
*Lackawanna, N. Y., base	1.70c
Birmingham, Ala., base	1.65c to 1.75c
Pacific Coast, c.i.f.	2.00c
Do., wide flange	2.10c

Bars

SOFT STEEL

*Pittsburgh, base	1.60c
Chicago, base	1.70c
Birmingham, Ala., base	1.65c to 1.75c
*Lackawanna, N. Y., base	1.70c
Pacific Coast, c.i.f.	2.00c
Cleveland, base	1.65c
Philadelphia, del.	1.91c
New York, del.	1.90c
Boston, del.	1.92c to 2.02c
Pittsburgh, cold finish	1.65c to 1.75c
Pittsburgh, forg. qual.	1.75c to 1.85c

RAIL STEEL

Chicago Heights	1.50c to 1.60c
Eastern mills	1.20c
Pittsburgh	1.30c to 1.35c

IRON

Chicago, base	1.60c to 1.70c
New York, delivered	1.85c to 1.95c
Philadelphia, delivered	1.86c to 1.96c
Pittsburgh, refined	2.70c to 4.20c

REINFORCING

Pitts., billet cut lengths	1.75c
Pitts., stock lengths, mill	1.60c
Chi., billet	1.75c
Chi., rail steel	1.55c to 1.65c
Chi., rail steel, road, bridge and culvert	1.55c
*Philadelphia, cut lengths	2.16c
Cleveland, cut lengths	1.75c

Cold Finished Bars, Shafting

Base Pittsburgh, Chicago, Buffalo and Cleveland	1.90c to 2.00c
Shafting, turned and ground, Pittsburgh, Cumberland, Md.	2.35c to 2.80c

Corrosion, Heat Resist. Alloys

Base, Pittsburgh

18 per cent chrome, 8 per cent nickel
Sheets, 35c; plates, 31c; bars, 28c.

	A	B	C	D
Bars	19c	20.5c	23c	28c
Plates	21c	22.5c	25c	30c
Sheets	26c	27.5c	30c	35c
Hot Strip	19c	20.5c	23c	28c
Cold strip	25c	26.5c	29c	34c

Carbon 0.12 and under; no nickel. A has chrome 15% and under. B over 15/18% inc., C over 18/23% inc., D over 23/30%.

Wrought Washers

Carloads, Pitts. dist.	$6.50 to 6.75 off
Carloads, Chicago dist.	7.00 to 7.50 off

Alloy Steel

Hot Rolled—F.o.b. Mills
Alloy Quality Bars, 2.65c, mill
(Differentials to various classes of consumers)

S.A.E.	Alloy Diff.
2000	0.25
2100	0.55
2300	1.50
2500	2.25
3100	0.55
3200	1.35
3300	3.80
3400	3.20
4100 .15 to .25 Mo.	0.50

4600 .20 to .30 Mo. 1.25-1.75 Ni.	1.05
5100 .80 - 1.10 Cr.	0.45
51.00 Cr. spring	0.20
6100 bars	1.20
6100 Spring	0.95
Cr., Ni., Van.	1.50
Carbon Van.	0.95
9250 (flats)	0.25
9250 (rds.,sq.)	0.50

Strip, Hoops, Bands

Hot strip, to 6 in., Pitts.	1.50c to 1.60c
Do, 6 1/16 to 24-in., Pitts.	1.40c to 1.50c
Hot strip to 6 in. Chi.	1.60c to 1.70c
Do, 6 1/16 to 24-in.	1.50c to 1.60c
Cooperage hoop, Pitts.	1.60c to 1.70c
Do., Chicago	1.70c to 1.80c
Cold-roll, strip, Pitts., Cleve.	2.00c
Worcester, 3 tons over	2.20c

Rails, Track Material

Standard rails, mill	$43.00
Relay rails, Pitts., 20 to 45 lbs.	$21.00 to 23.00
50 to 75	18.00 to 20.00
80 to 100	24.00 to 27.00
Light rails, 25-45, mills	$34.00
Light rails, Chicago	$36.00
Angle bars, mills	2.75c
Spikes, railroad, mills	2.60c
Spikes, railroad, 7/16-in. and smaller, Pitts.	2.60c
Spikes, boat, barge, Pitts.	2.90c
Track bolts, Chicago	3.50c
Do, standard, jobbers	73 off list
Track bolts, Chicago	3.50c
Tie plate, mills	$37.00

Bolts and Nuts

Pittsburgh, Cleveland, Birmingham, Chi. Discounts to legitimate jobbing or large consuming trade for full-case lots apply to May 10, 1930, lists.

CARRIAGE BOLTS

All sizes, cut thread	75 off
Rolled thread ⅜ x 6 and smaller take 10 per cent lower list.	
Eagle list	75 off

MACHINE BOLTS

All sizes, cut thread, lag screws, plow bolts, Nos. 1-2-3-7 heads, tap bolts, blank bolts, stud bolts without nuts	75 off
Tire bolts	60 and 10 off
Stove bolts, 80-25-10 off in pkgs.; 80 25-10-2½ off in bulk.	
Rolled thread machine bolts, ⅝ x 6 and smaller take 10 per cent lower list.	

NUTS

Semifinished	75 off

HEXAGON CAP SCREWS

Milled	80-10-10-5 off
Upset 1 in. diam. and smaller	85-10 off

SQUARE HEAD SET SCREWS

Milled	80-5 off
Upset, 1 in. and smaller	80-10-5 off
Upset, larger than 1 in.	80-5 off

Cut Nails, Chain, Piling

Cut nails, c.l. Pittsburgh	2.50c
Do. less carloads, 5 kegs or over	2.75c;
less than 5 kegs, 2.90c.	
Chain, BB, BBB, 9/16-1½ in.	33 1/3 off
Sheet piling, Pitts.	1.90c

Rivets

Struc., c.l., Pitts.-Cleve.	2.25c
Struc., c.l., Chicago	2.35c
7/16-in. and smaller, Pitts., Chicago, Cleve.	70, 10 and 5 off

Bars

Close of Quarter Brings Some Additional Specifications but Future Buying Is Not Active

BAR PRICES, PAGE 59

Chicago—Few contract orders for steel bars have been closed, buyers being cautious about the future. Spot sales command 1.70c, Chicago, as a base. Mixed carload business is frequent. Bar mill production is off to about 25 per cent, as against 25 to 30 per cent recently. This is due largely to lack of automotive business coming to this district through the partsmakers. Production of deformed bars has become more active. Rail steel bar mills are producing at 30 to 35 per cent, chiefly on road and bridge work, and scattered miscellaneous orders. Rail steel fence post business is poor.

New York—Commercial steel bar sellers were encouraged over an improvement in specifications against contracts as the quarter ended. Prices on domestic steel are firm at 1.60c, Pittsburgh.

Low bid on 38½ tons of bar rivet steel for Brooklyn navy yard, closed March 22, was 1.85c, delivered.

Philadelphia—Pending advance of $2 per ton for second quarter on soft steel bars resulted in some increase in specifications last week. The usual quotation is 1.60c, Pittsburgh.

Buffalo—Demand for steel bars improved somewhat as 1.60c, Lackawanna, continued to be available up to the beginning of the new quarter, which brought a 1.70c price. The trade has not had opportunity to test the firmness of the new quotation.

Pittsburgh—New business in steel bars still is light but 1.60c, Pittsburgh, is holding well. Specifications against lower priced contracts increased mildly the last few days of March and second quarter contracting slightly more active. Automotive demand is little changed and consumption by miscellaneous users is only steady.

Youngstown, O.—Further gains in bookings of common steel bars for second quarter are advancing operations of mills somewhat. Demand continues to come from miscellaneous sources with a fair sprinkling of automotive specifications. Alloy steel bar demand for March appears to have held level with February, which in turn made a gain over January. Mills are maintaining 1.60c, Pittsburgh, for soft steel bars for second quarter.

Cleveland—Determination to hold new prices is virtually the only feature to a listless market on soft steel bars. Beginning April 1 no orders were reported received by any of the mills for less than 1.65c, base, Cleveland. In fact, for several weeks prior to that date, spot carloads have been closed at that price. Forging interests, however, are being allowed to order for second quarter at a concession down to 1.55c, Cleveland, for forging quality bars. A large forging interest here last week entered the hands of a dissolving receivership, and all orders for stock on the mill-supplying books were cancelled.

Cold Finished Buying Holds at Moderate Rate

Cold Finished Prices, Page 59

Pittsburgh—Recent demand for cold-finished steel bars has been at the quiet rate of several weeks and March business was moderately below that of February. The market usually is quoted 2.00c, Pittsburgh.

Cleveland—Some upturn in specifications for cold-finished steel bars is expected almost daily from partsmakers here when they receive orders or releases from the Ford company. The market continues 2.00c, Cleveland, into second quarter.

Tin Plate Production Increasing Slowly

Tin Plate Prices, Page 59

Pittsburgh—Tin plate operations continue to expand slowly, with the current average close to 45 per cent. Specifications show but little change and although the outlook for can demand for packing purposes still is uncertain recent activity in disposition of stocks of canned goods has been encouraging. Tin plate continues $4.75, Pittsburgh, per base box.

The Texas Co. is inquiring for 75,000 boxes of tin plate for export.

Plates

Oil Tank Prospects Brighter—Some March Orders To Be Shipped This Month Under 1.60c

PLATE PRICES, PAGE 59

Chicago—Small tankmakers have been ordering out more plates. Plate quotations are nominal at 1.70c, Chicago, and mill operations are variable. Less than one-fourth of the districts capacity is engaged. Oil storage prospects are brighter with the advance in Mid-continent oil prices, and the increased consumption of gasoline for all companies. About 400 tons of plates for Illinois Steel Co. gas holders at Gary, Ind., are being held up.

Boston—With the exception of a few pending tonnages demand for plates is meager. Prices are firm, with 2.02c, delivered, on ordinary business. Coleman Bros. were awarded the general contract for the 60-inch water line at Newton, Mass., taking 1500 tons. Bath Iron Works, Bath Me., is low on a lighthouse tender, requiring a fair tonnage.

Philadelphia—Plate prices usually are 1.70c, base, Coatesville. Little tonnage is pending. Approximately 100 tons of plates are required for a lighthouse tender on which the Bath Iron Works, Bath, Me., is low. A Chicago concern booked the conveyors for the St. Nicholas coalbreakers, requiring 200 tons of plates.

New York—Plates are stronger at 1.70c, base, Coatesville, Pa., with a test expected in the next two weeks. Government work continues to feature the market, 1300 tons being placed, chiefly for the Panama canal commission.

Pittsburgh—Plate business is spotty and supported by poor demand from important consumers. No new business in river craft is noted although a fair tonnage is pending for prospective work. On new plate business 1.60c, Pittsburgh, is quoted but the market is yet to be tested thoroughly.

Cleveland—Activities in the plate market has reverted to a low point. Last week all three plate mills here, 72, 84 and 112-inch, of Otis Steel Co. went down for an indefinite period. Small orders are being billed at 1.60c, Pittsburgh, or its equivalent though orders received up to March 31 may be shipped through April, and, in many instances they were taken at lower levels.

Birmingham, Ala. — Considerable

time has elapsed since plate mills have had an opportunity to work steadily. Buyers are placing small contracts. Operations are less than 20 per cent of capacity.

Contracts Placed

800 tons, plates and flats, mainly plates, Panama, to Jones & Laughlin Steel Corp., Pittsburgh, and Bethlehem Steel Export Corp., Bethlehem, Pa., mainly to former. Schedule 2734.

497 tons, 362 plates, 135 shapes, crane ship, Panama Canal, to Bethlehem Steel Export Co., New York, $16,093.04.

321 tons, navy, Norfolk, Va., and Philadelphia, 295 tons to John T. Hill, Baltimore, and 26 tons for Norfolk only, to Youngstown Sheet & Tube Co., Youngstwn, O.

305 tons, stack and hoppers, power house, General Electric Co., Schenectady, N. Y., to American Bridge Co.

300 tons, two molasses tanks, L. M. Bidal Co., to Hammond Iron Works, Warren, Pa.

254 tons, 45-inch welded steel pipe, Los Angeles to Western Pipe & Steel Co., Los Angeles.

100 tons, tank, North Creek, N. Y., to Chicago Bridge & Iron Works, Chicago.

Contracts Pending

175 tons, plates and angles, second quarter requirements, department of plant and structure, New York; Seaboard Contracting & Supply Co., New York, low.

150 tons, plates and shapes, lighthouse tender HICKORY, Bath Iron Works, Bath, Me., low $152,480.

Railroads

New Haven Buys 10,000 Tons Rails—Some Accessory Demand—Shops More Active

TRACK MATERIAL PRICES, PAGE 59

New York—Domestic freight car awards totaled 105 in March, up from the low of February, but setting a first-quarter total of 299 against 2316 for the corresponding period of 1931. The following shows monthly comparisons:

	1932	1931	1930	1929
Jan.	159	100	5,072	13,196
Feb.	35	50	17,027	15,944
March	105	2,166	6,118	12,023
3 mo.	299	2,316	28,217	41,163
April	.....	2,798	1,997	8,205
May	.....	20	1,392	7,562
June	.....	1,910	998	5,886
July	.....	617	1,389	341
Aug.	.....	1,304	1,111	2,854
Sept.	.....	703	576	4,517
Oct.	.....	980	4,116	19,506
Nov.	.....	35	2,621	6,361
Dec.	.....	11	2,729	9,710
Total	.....	10,694	45,146	106,105

Norfolk & Western closes April 13 on 100 wrought steel wheels and the Pennsylvania closes April 12 on additional steel wheel requirements.

Pittsburgh—March showed a slight increase in specifications from railroads. The market is quiet in new business and inquiry with only small tonnages of rails and fastenings in prospect for those roads which have yet to enter the market. The car market remains quiet.

Cleveland—No award has as yet been announced on gondolas for the Wheeling & Lake Erie and the status of the order is still unchanged in that possibly 50 cars may be bought, instead of the advertised 100. New York Central shops here are recalling men who were laid off in some departments the middle of March .

Chicago—Fairly steady buying of track accessories features the railroad steel market. Sales total about 6000 tons in the last week and schedules for this week indicate 2500 to 3000 tons. Of the total just specified, about 3000 to 4000 tons was for the Minneapolis, St. Paul & Sault Ste. Marie. It has become increasingly evident that western roads are sorely in need of maintenance and track work as well as equipment repairs. Maintenance work is being carried on with as little new rail buying as possible, several roads ordering track fastenings without rails. Illinois Central, after 12 months of decline in net operating income, reversed the trend in January, showing an increase of about 62 per cent. A western carrier has specified 2000 tons of rails on 1930-31 carryover. Rail mills are expected to continue for about three weeks on existing schedules.

Rail Orders Placed

New York, New Haven & Hartford, 10,000 tons, 130-pound rails, to Bethlehem Steel Co., Bethlehem, Pa., and Carnegie Steel Co., Pittsburgh.

Car Orders Pending

Pacific Fruit Express, 100 underframes for refrigerators; previously noted as going to the company's own shops.

Bolt, Nut Contracts for Second Quarter Signed

Bolts, Nuts, Rivets Prices, Page 59

Chicago—Second quarter contracting for bolts, nuts and rivets has been virtually completed. Only a few buyers have failed to return their signed contracts. The 2.35c carload price for large structural rivets is expected to remain during second quarter.

Pittsburgh—Second quarter contracting for bolts, nuts and rivets is well advanced with 75 off for bolts and nuts well observed. Large rivets continue 2.25c, Pittsburgh. Specifications against contracts continue quiet, slight improvement being attributed to the price advance in bolts and nuts. Railroads and structural shops continue light buyers.

Cleveland — Bolt and nut sales continue disappointing, although producers seem cheered by acceptance of the 75 off discount and the potentialities of a Ford production program, now that the models have been exhibited. Ford's bolt and nut specifications have been light.

Wire Movement Steady; Second Quarter Slow

Wire Prices, Page 59

Pittsburgh—Wire producers look for additional improvement in business during April following a slight gain last month. Prices are held firmly at $1.95 for carload lots of wire nails, 2.20c for plain wire and $37 for wire rods.

Cleveland—The price situation of plain wire and nails tends toward firmness. Producers note more strength at 2.20c and $1.95, respectively, within the past two weeks than at any time within the last three months. After unsuccessful attempts to break the $37 per ton base on wire rods, that product is strong.

Worcester, Mass.—Wire production shows little change. Prospects of reaching a spring peak depend upon increased automotive demand. Prices are steady.

Philadelphia—Prices of wire and wire products are unchanged and demand remains about the same, without improvement.

Chicago—March shipments of merchant and manufacturers' wire products were approximately the same as February. Only a few contracts have been signed for second quarter, and forward interest continues slow. Quotations of 2.25c, Chicago or western mills, for plain wire and $2 for standard wire nails continue to prevail despite slow contract business. Jobber stocks are fairly low. Manufacturers' wire has not begun to reflect upturn in automotive business.

Structural Shapes

American Bridge Gets 3800-Ton Project—Postpone 200,000 Tons at Chicago For Three Years — Phoenix Bridge Co. Low On Troy Bridge—Week's Awards Off

STRUCTURAL SHAPE PRICES, PAGE 59

New York—Phoenix Bridge Co. is low on the Troy-Menands bridge superstructure, 8300 tons, while the McLennan Construction Co., Chicago, is low on the general contract for the Newark postoffice and courthouse, but supplemental bids will be taken. Twenty firms bid on the Newark contract, requiring about 6000 tons. There is a slight gain in the demand for small lots. Department of purchase closes April 8 on a small tonnage for reconstruction of a part of the Williamsburg bridge approach in Brooklyn. Prices on plain material are now 1.60c on new business and appear firm on the limited amount of business being placed. Inquiry is a trifle heavier.

Boston—A slight increase is noted in small-lot business, both awards an inquiry. Bids are in on two of the largest pending tonnages, a pier at Bourne, Mass., and the Latin school here. The Manchester, N. H., postoffice on which bids were taken weeks ago is being redesigned. A small lot for the Middleboro postoffice and the Orient theater, East Boston, have been awarded. A small tonnage has also been placed for the Monsignor Coyle high school at Taunton, Mass.

Philadelphia—Award of 3800 tons in the Franklin memorial building to American Bridge Co., featured the market last week. A fairly good tonnage is pending for nearby work in this district. Of encouragement is a slightly better disposition on the part of banks to finance construction. Shapes are holding generally at 1.75c, Philadelphia.

Pittsburgh — Structural steel awards and inquiry hold at about their recent volume, while specifications for plain material are quiet and unchanged. Shapes remain to be established firmly at 1.60c, Pittsburgh.

Cleveland—Bids close April 8 on about 900 to 1000 tons of structural shapes for the foundation work for the Cleveland postoffice, which must be built by the Cleveland Union Terminals Co. It is expected that plans will be released from Washington by April 15 for the superstructure to take about 11,000 tons. Release of plans is expected shortly for the Fowler high school addition here and the Oberlin university auditorium and powerhouse. About 140 tons in the west side Masonic building was bought here last week. Plain material is being quoted at 1.60c, Pittsburgh.

Chicago—Miscellaneous structural projects are more numerous. Chicago officials have taken steps to postpone further work in subway construction, which would amount to about 200,000 tons. Postponement would be for three years. Fabricators are figuring on 3000 tons for the municipal auditorium, St. Louis, and a bridge over the Illinois river at Ottawa, Ill., 3000 tons, is active. Iowa has awarded 600 tons of bridge work and Indiana highway commission, 900 tons. Specific projects govern plain material sales. Quotations are based on 1.70c, Chicago.

Birmingham, Ala. — Ingalls Iron Works Co. has announced receipt of order for dredge boat from United States engineers at Galveston, Tex., 600 tons of steel to be used, and fabrication to be done in Birmingham.

Contracts Placed

3800 tons, Franklin memorial, Philadelphia, to American Bridge Co., Pittsburgh.

1600 tons, state highway bascule span, DePere, Wis., to American Bridge Co., Pittsburgh, on reopened bids.

1000 tons, state bridge over Clackamas river, Oregon, to Poole & McGonigle, Portland, Oreg.; Lindstrom & Feigenson, Portland, contractors.

600 tons, steam plant, Philadelphia & Reading Coal & Iron Co., St. Nicholas, Pa., to Ingalls Iron Works Co., Verona, Pa.

550 tons, concentration mill, Picher, Okla., Eagle Picher Lead Co., to Muskogee Iron Works, Inc., Muskogee, Okla., noted in STEEL, March 7, as 250 tons.

500 tons, Indiana bridge work, to Vincennes Bridge Co., Vincennes, Ind.

400 tons, bridges, Indiana highway commission, to Central States Bridge Co., Indianapolis.

330 tons, state bridges, Marshall and Johnson, Okla., to J. B. Klein Iron & Foundry Co., Oklahoma City, Okla.

300 tons, bridge spans, Madison county, Iowa, to Pittsburgh-Des Moines Steel Co., Des Moines, Iowa.

300 tons, (including some reinforcing and cast steel), county bridge, Mineral county, Mont., to unnamed eastern interests.

275 tons, state bridges, Cotton county, Oklahoma, to J. B. Klein Iron Co., Oklahoma City, Okla.; Roberts & Fisher, Normand, Okla., contractors.

140 tons, West Side Masonic building, Cleveland, to Fort Pitt Bridge Works, Pittsburgh.

140 tons, building, Lever Bros., Hammond, Ind., to unstated.

135 tons, fire house, Philadelphia, to Henry A. Hitner Sons, Philadelphia.

120 tons, high school addition and gymnasium, Baltimore, to Dietrich Bros., Baltimore; L. L. Chambers, contractor.

115 tons, high school addition, Beverly Hills, Calif., to Pacific Iron & Steel Co., Los Angeles.

115 tons, amusement hall, Revere, Mass., to New England Structural Co., Boston.

111 tons, state bridge, Santa Fe river, Alachua and Columbia counties, Florida, to Virginia Bridge & Iron Co., Roanoke, Va.; John Johnson, Lakeland, Fla., contractor. Dudley Bar Co., Birmingham, Ala., awarded 26 tons reinforcing bars.

104 tons, two bridges, Crockett and Pecos counties, Texas, to Houston Structural Steel Co., Houston, Tex.; M. H. Ryland, Uvalde, Tex., contractor.

100 tons, balancing tank, Lynchburg, Va., to Pittsburgh-Des Moines Steel Co., Pittsburgh.

100 tons, approximately, shapes and bars, ice storage plant, Detroit City Service Co., Detroit; 80 tons shapes to R. C. Mahon Co., Detroit, and 10 tons reinforcing to Joseph T. Ryerson & Son Inc., Chicago. Walbridge-Aldinger Co., Detroit, contractor.

100 tons, two bridges, Crockett and Pecos counties, Texas, to Alamo Iron Works, San Antonio, Tex.; M. H. Ryland, Uvalde, Tex., contractor.

100 tons or more, school addition, Marathon, N. Y., to unstated fabricator; J. Buckheit & Son, Syracuse, N. Y., contractors.

100 tons, angles and shapes, navy, Brooklyn, N. Y., and Norfolk, Va., to Egleston Bros. & Co., Long Island City, N. Y.; opening of March 8.

100 tons, Monsignor Coyle high school, Taunton, Mass., to John E. Cox Co., Fall River, Mass.; Rowley Construction Co., Pawtucket, R. I., contractor. Job also includes 95 tons bar joists, to be placed.

100 tons, junior high school, Trinity Heights, Tex., to Austin Bros., Dallas, Tex.; E. C. Kert-Burton Construction Co., Dallas, contractor.

100 tons, armory, Salinas, Calif., to Moore Drydock Co., Oakland, Calif.

Awards Compared

	Tons
Awards, week ended Apr. 2..	**9,535**
Awards, week ended Mar. 26	**16,975**
Awards, week ended Mar. 19	**20,461**
Awards, this week in 1931	**143,904**
Av. weekly awards, 1931....	**34,236**
Av. weekly awards, 1932....	**12,839**
Av. weekly awards, March....	**17,003**
Total awards to date, 1931..	**645,067**
Total awards to date, 1932	**179,756**

Contracts Pending

8300 tons, Troy-Menands Bridge, New York; Phoenix Bridge Co., Phoenixville, Pa., low, $957,181. Bids March 30.

6000 tons, postoffice and courthouse,

Newark, N. J.; McLennan Construction Co., Chicago, low, $3,435,000; bids March 30.
6000 tons, office building, Insurance Company of North America, John street, New York; bids probably this month.
4000 tons, building for Hershey Chocolate Co., Hershey, Pa.; bids asked on new design.
3000 tons, highway bridge over Illinois river near Ottawa, Ill.
3000 tons, municipal auditorium, St. Louis.
900 tons, apartment, Park avenue-Seventy-second street, New York.
900 tons, substructure, postoffice, Cleveland; bids April 8, Cleveland Union Terminals Co.
700 tons, building, Keebler Weyl Baking Co., Philadelphia; specifications soon.
700 tons, postoffice, Rockford, Ill.
600 tons, state highway bridge, Columbus Junction, Iowa.
600 tons, waterfront project, Stockton, Calif.; bids April 4.
550 tons, garage, Long Island City, N. Y.
270 tons, pulp and paper mill building, New Orleans.
265 tons, bridge approach, Savanna, Ill.
250 tons, pier No. 11, Philadelphia, for Reading Co.
250 tons, building, Cascade Steam Laundry Co., Brooklyn, N. Y.
250 tons, pier, Port Richmond, Staten Island, New York.
250 tons, building, Hammermill Paper Co., Erie, Pa.
200 tons, city hall, Van Nuys, Calif.; bids soon.
175 tons, grandstand at fair grounds, Pomona, Calif.; bids soon.
150 tons, estimated, frame for sluice gates, United States engineer, Milwaukee; Pittsburgh-Des Moines Steel Co., Pittsburgh, low.
100 tons, postoffice, New Kensington, Pa.; Nicholas Co., Philadelphia, awarded general contract.
100 tons or more, reconstruction over Driggs avenue, Brooklyn approach, Williamsburg bridge, New York; bids direct April 8, department of purchase.
100 tons, College of Pharmacy, Boston.

Concrete Bars

Inquiry Volume Improving —Bid April 8 On 750 Tons For Vermont—1000 Tons Out In April For Illinois Waterworks—Troy Bridge And Newark Postoffice Pend

REINFORCING BAR PRICES, PAGE 59

New York—A slight increase in small-lot projects is noted in the demand for reinforcing bars. A Brooklyn, N. Y., sewer will take several hundred tons while additional contracts on the Grand Central highway, a state project, will require about 200 tons. The Newark postoffice and Troy-Menands bridge are among the largest jobs out. Approximately 83 tons for a pier were placed. Prices are firm at 1.60c, Pittsburgh, on new business, bids having been withdrawn on all other quotations. The new price, however, is yet to be tested on volume business. Bids open April 21 for the foundations of a new federal court building at New York which will take a large tonnage.

Boston—Seasonal pick-up in reinforcing steel is slow. Few inquiries taking more than 100 tons each are before the market. Approaches to the East Boston traffic tunnel, taking about 125 tons, have been placed, also about 100 tons for a police station, Berkeley street. Bids go in next week on close to 750 tons for hghway work in Vermont. Prices on small lots are firmer with 1.60c the market.

Pittsburgh—New business in reinforcing bars is increasing slowly and the volume of prospective work gives a fairly good tone to the market. Specifications against old orders are well maintained. However, local activity continues quiet. The 1.60c price is partly nominal as a result of the lack of a test.

Philadelphia—While current demand is light, 250 tons for the Franklin memorial and 150 tons for an auto upholster's building are expected to be placed. Prices are nominal at 1.60c, Pittsburgh.

Cleveland—Reinforcing steel demand is spotty. Building operations calling for concrete construction are lacking. Bids are being submitted to a Cleveland contractor for about 500 tons of rods for grade crossing elimination bridges at Elmira, N. Y., for the Delaware, Lackawanna & Western railroad.

Chicago—Slight improvement is shown in reinforcing bar prospects. Probably 1000 tons will be bought for the Elgin, Moline and Wilmette, Ill., waterworks plants this month. Figures are being taken on about 300 tons for the government appraisers' stores building, Chicago. Terre Haute, Ind., postoffice, 300 tons, is being refigured.

Birmingham, Ala. — Immediate business is far from satisfactory. Mills of Connors Steel Co. are still idle though are being prepared for early resumption. Both Tennessee Coal, Iron & Railroad Co. and Gulf States Steel Co. are producing on a small scale.

Awards Compared

	Tons
Awards, week ended Apr. 2	3,502
Awards, week ended Mar. 26	4,120
Awards, week ended Mar. 19	3,419
Awards, this week, 1931.....	10,870
Av. weekly awards, 1931.....	6,808
Av. weekly awards, 1932.....	3,924
Av. weekly awards, March..	3,997
Total awards to date, 1931..	107,998
Total awards to date, 1932	64,949

Contracts Placed

390 tons, Sheridan school, Minneapolis, to Laclede Steel Co., St. Louis; National Contracting Co., Minneapolis, contractor.
382 tons, state paving projects in eastern Washington and state bridge over Okanogan river, Wash., to Northwest Steel Rolling Mills, Seattle.
250 tons, state bridges, Crockett and Pecos county, Texas, to Central Texas Iron Works, Waco, Tex.; M. H. Ryland, Uvalde, Texas, contractor.
245 tons, addition, Library of Congress, Washington, to Concrete Steel Co., New York, through Jacobson Bros., Chicago, contractor.
186 tons, junior high school, Trinity Heights, Tex., to Austin Bros., Dallas, Tex.; E. C. Kert-Burton Construction Co., Dallas, contractor.
162 tons, East Marginal Way viaduct, Seattle, to Pacific Coast Steel Corp., Seattle.
150 tons, Venice boulevard bridge, Los Angeles, to Blue Diamond Co., Los Angeles.
150 tons, concentration mill, Eagle Picher Lead Co., Picher, Okla., to Sheffield Steel Corp., Kansas City, Mo.
130 tons, Hamilton county, Ohio, tuberculosis hospital, to West Virginia Rail & Steel Co., Huntington, W. Va.
125 tons, approaches, traffic tunnel, Boston-East Boston, Mass., to Joseph T. Ryerson & Son Inc., Chicago.
119 tons United States engineer, Memphis, Tenn., to Jones & Laughlin Steel Corp., Pittsburgh; also 7½ tons, galvanized steel straps, 1003 pounds channels and 3764 pounds plates; bids Feb. 16.
115 tons, state bridges, Cotton county, Oklahoma, to J. B. Klein Iron Co., Oklahoma City, Okla.; Roberts & Fisher, Normand, Okla., contractors.
108 tons, county high school, Missoula, Mont., to Pacific Coast Steel Corp., Seattle; J. E. Hightower, Missoula, contractor. Montana Iron Works, Butte, Mont., awarded 40 tons structurals.
100 tons, high school addition and gymnasium, Baltimore, to Diedrich Bros., Baltimore; L. L. Chambers, general contractor.
100 tons, 3-story plant, Continental Can Co., Harvey, La., to Laclede Steel Co., St. Louis; R. P. Farnsworth & Co. Inc., New Orleans, contractor.
100 tons, police station, Berkeley street, Boston, to Truscon Steel Co., Youngstown, O.
100 tons, Los Angeles county for Sy-

camore wash project, to Blue Diamond Co., Los Angeles.

Contracts Pending

1000 tons, postoffice, Washington; bids April 8.
750 tons, state highways, Vermont; bids April 8.
500 tons, waterworks and sewage disposal plant, Moline, Ill.; bids April 8.
500 tons, grade elimination bridges, Elmira, N. Y., for Delaware, Lackawanna & Western railroad.
500 tons, waterfront project, Stockton, Calif.; bids April 4.
350 tons, bridges, Carrollton-Gratz road, Kentucky, for Kentucky highway department.
300 tons, postoffice, Terre Haute, Ind.; being refigured.
300 tons, waterworks, Wilmette, Ill.; bids April 5.
250 tons, Franklin memorial, Philadelphia.
250 tons, sewage disposal plant, Elgin, Ill.
230 tons, highway work, San Diego county, Calif.; bids opened.
216 tons, highway work, Riverside county, Calif.; bids April 6.
200 tons, alterations, state capitol, Springfield, Ill.; bids March 22.
200 tons, Keebler-Weyle Baking Co., Philadelphia.
150 tons, building, Collins & Aiken, Philadelphia.
145 tons, addition, warehouse, Sofia Bros. Inc., New York.
125 tons, 185,000 pounds ⅞-inch, and 65,000 pounds ½-inch, sewer department, Washington; Capital Fireproof Products Corp., Rosslyn, Va., and Maryland Steel Products Co., Baltimore, low.
122 tons, H street bridge, Sacramento, Calif.; bids soon.
120 tons, veterans' hospital buildings, Sheridan, Wyo.; MacDonald Engineering Co., Chicago, contractor.
113 tons, highway work, Orange county, Calif.; bids opened.

Pipe

Eight Thousand Tons Develop for California Gas Line—150,000 Tons Placed for Irak

PIPE PRICES, PAGE 74

New York—Municipal buying of cast pipe is smaller than usual, although there is a seasonal increase in inquiries and orders. On readvertised bids for several hundred tons for Mt. Vernon, N. Y., Donaldson Iron Works was awarded the lot. Bids for the Brentwood, N. Y., project are being readvertised. Low on 350 tons of 12-inch cast pipe for Binghamton, N. Y., was $27.20 a ton delivered or $22.40, foundry. For the North Creek, N. Y., water district, contracts have been formally awarded for approximately 550 tons of cast pipe, to Central Foundry Co., and R. D. Wood & Co.

American pipemakers have failed to participate in the 150,000 tons for the Irak pipe line, distribution being among French, German and British producers.

Boston—Springfield and Natick, Mass., have bids on several hundred tons of cast pipe. Prices still are weak, with New Jersey foundries offering stiff competition to the local plants. Winooski, Vt., placed about 175 tons.

Pittsburgh—Pipe demand generally is quiet and unchanged although some producers report a slight gain in standard pipe business during March. Activity still is restricted by quietness in building operations. Inquiry for about 8000 tons of 12¾-inch pipe for a 68-mile gas line in California for the Southern Counties Gas Co., is expected to be closed shortly. The outlook for oil country products over the next several months is poor. Pipe mill operations continue around 20 per cent. A. M. Byers Co. has booked 750 tons, mainly 18-inch, wrought iron pipe for the Panama canal zone.

Chicago—Steel pipe line inquiry is confined to a few minor natural gas distributing connections. Northern Natural Gas System, Omaha, Nebr., has awarded general contract for 30 miles of 4 and 8-inch pipe from David to Columbus, Nebr. The United States engineers office at Cincinanti will buy 2000 feet of 24-inch steel dredge pipe. About 1500 tons of miscellaneous cast pipe sizes will be required for waterworks and sewage disposal plants at Elgin, Moline, and Wilmette, Ill. Cast prices are nominal at $38.40 to $40.40, delivered Chicago, on 6 to 24-inch sizes.

Birmingham, Ala. — Hope is expressed that federal financial assistance will make it possible for municipal, county and state governments and even private corporations to consider developments which will require cast iron pressure pipe. Awards recently have been small.

Cast Pipe Placed

700 tons, 8 to 16-inch, wrought iron pipe, Panama, for oil line to A. M. Byers Co. at $60,844, $26,200 and $6548.70, three classes.
450 tons, 8-inch, and fittings, Springfield, Mass., to R. D. Wood & Co., Philadelphia.
400 tons, 12-inch, Mt. Vernon, N. Y., to Donaldson Iron Works, Emaus, Pa.
300 tons, 6-inch, Lancaster, O., to James B. Clow & Sons, Chicago.
250 tons, 6 and 8-inch, Cedar Grove, Wis., to James B. Clow & Sons, Chicago.
234 tons, 6-inch class 250, Ben Lomond, Calif., to United States Pipe & Foundry Co., Birmingham, Ala.
150 tons, 6-inch, Winooski, Vt., to Warren Pipe & Foundry Co., Phillipsburg, N. J.
125 tons, 6 and 8-inch, Portsmouth, O., to American Cast Iron Pipe Co., Birmingham, Ala.
100 tons or more, up to 47-inch, Lancaster, Pa., to United States Pipe & Foundry Co., Burlington, N. J.

Steel Pipe Placed

Unstated tonnage, 9700 one-inch, cold-drawn seamless boiler tubes, 0.095-inch wall, navy, Brooklyn, to National Tube Co., Pittsburgh, $5428.61.

Cast Pipe Pending

598 tons, 6 and 8-inch class 250, Glendale, Calif., R. D. Wood & Co., Philadelphia, low.
555 tons, 6 and 8-inch class 250 or B, Oakland, Calif., United States Pipe & Foundry Co., Birmingham, Ala., low.
500 tons, miscellaneous sizes, waterworks and sewage disposal plant, Moline, Ill.; bids April 8.
500 tons, miscellaneous sizes, sewage disposal plant, Elgin, Ill.
350 tons, 12-inch, Binghamton, N. Y., R. D. Wood & Co., Philadelphia, low.
300 tons, various sizes, state hospital, Brentwood, N. Y., readvertised.
300 tons, miscellaneous sizes, Wilmette, Ill., waterworks; bids April 5.
248 tons, 4 and 6-inch class B, San Diego, Calif.
200 tons, 6 to 20-inch, Natick, Mass.; bids in.
100 tons, 6 to 12-inch class 150, Lynwood, Calif.
100 tons, various sizes, Walkill, N. Y.
Unstated tonnage, bridge, class A, Troy, N. Y.

Steel Pipe Pending

8000 tons, 68 miles, 12¾-inch line pipe for Southern Counties Gas Co., Los Angeles.
2000 feet, 24-inch steel dredge pipe for United States engineer's office at Cincinnati; general contract to Treadwell Construction Co., Midland City, Pa.
Unstated tonnage, 30 miles of 4 to 8-inch natural gas distributing line for Northern Natural Gas System, Omaha, Nebr.; McGee Construction Co., Oklahoma City, Okla., general contractor.
Unstated tonnage, 3454 one-inch cold-drawn seamless boiler tubes, 1290 for New York and 2164 for Philadelphia with 0.095-inch wall, mainly 8 feet, 9 inches long.

Choose Bridge Contestants

New York—The jury in the annual steel bridge design contest of the American Institute of Steel Construction has selected the 10 best contestants and will meet again May 5 to select the best from the finished 10 designs.

Strip

Slight Gain In Automotive Needs Changes Situation Little —Prices Are Steady and Firm

STRIP PRICES, PAGE 59

Pittsburgh—Despite a slight improvement in releases from Ford partsmakers automotive strip demand shows little change. Business is providing operations of 20 to 25 per cent for hot mills with cold strip production on a lower basis. Expiration of contracts gave a slight stimulus to specifications while the market is steady on new business at higher prices of 1.40c to 1.50c and 1.50c to 1.60c for hot strip and 2.00c for cold-rolled.

New York — Hot strip continues quiet at 1.40c and 1.50c, Pittsburgh, on carlots, with $2 a ton premium quoted on less than carlots. Most sellers are quoting 2.00c, Pittsburgh, on cold-rolled.

Philadelphia—Hot-rolled strip is steady at 1.40c and 1.50c, Pittsburgh, for carlots and cold-rolled is 2.00c, Pittsburgh. Specifications are light.

Youngstown, O.—Strip steel trade, paralleling the expansion in sheet mill activities due to larger volume of specifications for April and May delivery, shows substantial signs of expansion. The strip market appears firmer than in first quarter, particularly in hot-rolled. Demand for cold-rolled still is confined to small lots.

Cleveland—Inasmuch as Ford Motor Co. business has not been received to any greater degree by local partsmakers than before the new cars were announced, little aid has come to strip steel suppliers from that or any other automotive interest. One running-board maker has completed an initial order for Ford parts. Hot-rolled strip April 1 became quoted, without preference, at a flat 1.40c and 1.50c, Pittsburgh, on the two widths. Prior to that date, through March 31, mills received orders to be rolled either at their or the customers' convenience through April. On April 30, such strip orders will be cancelled or applied with the 1.40c or 1.50c, base. Continued reports are heard of weakness in cold-rolled strip. Several nonintegrated mills are reported to be quoting prices incompatible with 2.00c, Cleveland, on cold-rolled for second quarter. A downstate general manufacturer and a nearby producer of automobile lamps were good specifiers of hot-rolled last week.

Construction at Boulder City, Nev., and the Hoover dam on the Colorado river is six months ahead of schedule. Six Companies Inc. is employing 3000 men and Boulder City now has a population of 5000.

Youngstown's Gain Holds Operations to 23 Per Cent

Pittsburgh—Steel plant operations still lack a definite trend. Ingot production eased slightly during the past week to 22-23 per cent against 23.5 the previous week. Blast furnace schedules are unchanged with 11 active steelworks stacks of 54. Tin plate output is slightly higher at 45 per cent with sheets unchanged at 25, pipe at 20 and strip 20 to 25.

Operations week ended Apr. 2	**23**
Operations, week ended Mar. 26	**23**
Operations, week ended Mar. 19	**24.5**
Operations, this week, 1931	**55**
High for 1932, Feb. 6	**28.5**
Low for 1932, Jan. 2	**22**

Philadelphia — Ingot operations were fractionally lower in eastern steel plants last week, down to 16 per cent of capacity. However, an improvement in specifications, particularly for bars, plates and shapes, as the first quarter ended is expected to be reflected shortly in a slight upturn.

Buffalo—Operations are expected to reach a higher point this week, with 14 or more open hearths scheduled. Last week-end's schedule indicated a rate of 38 per cent which is an increase of 14 points from the low of the previous week. Mill executives are hopeful that the gains can be held for at least ten days.

Youngstown, O.—District operations last week were up six points at 25 per cent and were expected to continue in the present week at about one-fourth rated capacity. Twenty-five of 83 open hearths in this district are melting. Indications are at hand that operations by this time next week may be 30 per cent.

Cleveland—Ingot production sank last week to the lowest weekly level since one week early in October, 1930. Last week eight active open hearths of 34 represented 23 per cent of capacity, down 6 points from the week before last. This week there is little indication of improvement as Otis Steel Co.'s activities apparently are down for a period. Corrigan, McKinney Steel So. operates four open hearths, American Steel & Wire Co.'s Newburgh works, four.

Chicago—At least five open-hearth furnaces will be taken off this week, and ingot production consequently will be reduced to about 22 to 23 per cent. Production in the week just closed was about 24 per cent. Steelworks blast furnace activity is unchanged, with nine of the 36 stacks active. Illinois Steel Co. continues to bank its Joliet, Ill., furnace during alternate weeks.

Birmingham, Ala. — With four open-hearth furnaces in operation at Fairfield, Ala., and two at Gadsden, Ala., operations were at 21 per cent of capacity last week, down three points from the previous week. Improved activity seems assured for the second week in April.

Warehouse Buying Dull As Seasonal Needs Lag

Warehouse Prices, Page 74

New York—March brought no improvement in warehouse volume. Usually an active month, this year it was almost as low as the poorest of 1931. Prices are nominally unchanged, but in a few instances where attractive business appears, shading is evident.

Boston—Blue annealed sheets are now included in the quantity price plan, with plates and bars being quoted 3.50c. Prices on most warehouse steel products are holding fairly well, but volume has failed to develop. March with most jobbers was one of the slowest on record.

Philadelphia—Warehouse buying in March showed about a 5 per cent decline and the outlook is unsettled. Prices are unchanged but foreign steel offerings are causing agitation.

Pittsburgh—Sales volume is unchanged, March business comparing rather unfavorably with February. Bolt prices have been advanced to 70 off list. Other quotations are unchanged.

Detroit—At a season when warehouse demand usually is at its spring peak the situation is practically at the level of a month ago. Hopes are entertained that present efforts to quicken automobile sales will be reflected ultimately in warehouse demand. Bolts and nuts in case lots are 70 and 10 off list; in less than case lots, 70 off.

Raw Material Prices

Delivered pig iron prices subject to 10 per cent freight surcharge, maximum 13.44c gross ton, from Jan. 4

Pig Iron

Per Gross Ton

FOUNDRY, NO. 2

Chicago furnace	$16.50
Pittsburgh, dist. fur.	15.50 to 16.00
Pittsburgh, delivered	16.13 to 17.13
Valley furnace	15.00 to 15.50
Cleveland fur., local del.	15.50
Philadelphia, delivered	15.26 to 15.76
Virginia furnace	17.50
Granite City, Ill., fur.	16.50 to 17.50
Buffalo, fur., local del.	16.00
Buff., all-rail, Boston	19.91 to 20.41
Buff., all-rail, Brooklyn	19.40 to 19.90
Buff., all-rail, Newark	17.78 to 18.28
Ala., Bir. fur., local del.	11.00
Ala., Nor. del., Bir. base	10.00
Alabama, del. Chicago	16.01
Alabama, del. St. L.	14.42
Alabama, del. Cincinnati	13.82
Ala., Phila., dock del.	15.00 to 15.25
Ala., Balt., dock del.	15.00
Alabama, New York dock	15.50
Ala., Boston dock del.	16.50 to 16.75
Tenn., Bir. base, local del.	13.00
Tennessee, del. Cinn.	13.82
Montreal, delivered	23.00 to 23.50
Toronto, delivered	22.10

FOUNDRY, NO. 2X

Buffalo, fur., local del.	16.50
Buff., all-rail, Brooklyn	19.90 to 20.40
Buffalo, all-rail Newark	18.28 to 18.78
Buff., all-rail, Boston	20.91 to 21.41
Virginia furnace	18.00
Eastern, del. Phila.	15.76 to 16.26

FOUNDRY, NO. 1X

Buffalo fur., local del.	17.50
Eastern, del. Phila.	16.26 to 16.76

MALLEABLE

Valley furnace	15.50
Cleveland fur., local del.	15.50
Pittsburgh dis. fur.	16.00
Pittsburgh, delivered	16.63 to 17.13
Chicago, furnace	16.50
Buffalo fur., local del.	15.50 to 16.00
Eastern Penna., delivered	17.76 to 19.91
Granite City, Ill., fur.	16.50 to 17.50
Montreal, delivered	24.00
Toronto, delivered	22.60

BASIC

Pittsburgh, district fur.	15.00
Pittsburgh, delivered	15.63 to 16.13
Eastern Penn., del.	15.50 to 16.00
Buffalo fur., local del.	15.50 to 16.00
Montreal, delivered	23.50
Valley, furnace	15.00

BESSEMER

Valley furnace	15.50 to 15.75
Pittsburgh, delivered	16.63 to 17.13
Pittsburgh, furnace	16.00

LOW PHOS.

Valley fur., standard	25.00
Philadelphia, standard	23.76 to 26.79
Copper-bear., E. Pa. fur.	21.50 to 23.00

GRAY FORGE

Valley furnace	15.00
Pittsburgh district fur.	15.50
Pittsburgh, delivered	16.13 to 16.63

CHARCOAL

Lake Superior, del. Chicago	23.04

SILVERY

Jackson County, O., fur. in per cents: 6—$18; 7—$18.50; 8—$18.75; 9—$19; 10—$19.50; 11—$20; 12—$20.50; 13—$21.50; 14—$22.50; 15—$23; 16—$24; 17—$25.50.

Pittsburgh and Buffalo furnace: 7 to 10—$19.50; 15—$23 to $24.

BESSEMER FERROSILICON

Jackson County, O., fur., in per cents: 10—$20.50; 11—$21; 12—$21.50; 13—$22.50; 14—$23.50; 15—$24; 16—$25; 17—$26.50.

Coke

Prices Per Net Ton

Beehive Ovens

Connellsville furnace	$2.25
Connellsville foundry	3.25 to 4.50
New River foundry	6.00
Wise county foundry	4.25 to 5.00
Wise county furnace	3.50 to 4.25

By-Product Foundry

Newark, N. J., del.	8.76 to 9.16
Chicago, ovens	7.50
New England, del.	10.50
St. Louis, del.	8.50
Birmingham, ovens	4.50
Indianapolis, del.	8.25
Ashland, Ky., ovens, Connell., basis	5.50
Portsmouth, O., ovens Connell., basis	5.50
Buffalo, ovens	7.50 to 8.00
Detroit, ovens	8.00
Philadelphia, del.	8.75

Iron Ore

LAKE SUPERIOR ORE

Gross ton, 51½%, Lower Lake Ports

Old range bessemer	$4.80
Mesabi bessemer	4.65
Old range nonbessemer	4.65
Mesabi nonbessemer	4.50
High phosphorus	4.40

EASTERN LOCAL ORES

Cents per unit delivered at Eastern Pennsylvania and New Jersey furnaces

Foundry and basic, 56-63%, contract	9.00
Copper-free low phos. 58-65%	nom.

FOREIGN ORE

Cents per units, alongside docks Atlantic ports

Foreign manganiferous ore, 45-55% iron, 6-10% man.	9.50 to 10.00
North African low phos.	8.00 to 9.00
Swedish basic, 65%	8.00
Swedish low phos.	9.00
Spanish, North African basic, 50 to 60%	7.00 to 8.00
Newfoundland fdy., 55%	8.00
Tungsten, spot and future short ton unit, duty paid	$10.75 to 11.00
Chrome ore, 48% gross ton c.i.f.	$17.00 to 18.00

Manganese Ore

Prices, not including duty, are cents per unit; cargo lots.

Caucasian, 52-55% (nom.)	24 cents
South African, 52%	23 to 24 cents
South African, 49-51%	22 to 23 cents
South African, 44-47%	21.00 to 21.50
Indian, 48-50% (nom.)	24 cents
Brazilian, 46-48% (nom.)	20 to 21 cents

Refractories

FIRE CLAY BRICK

Per 1000 f.o.b. Works

First Quality

Pennsylvania, Ohio, Illinois, Kentucky, Maryland, Georgia, Alabama	$38.00
Missouri	35.00

Second Quality

Pennsylvania, Ohio, Illinois, Kentucky, Missouri, Maryland	25.00 to 30.00
Georgia, Alabama	30.00

SILICA BRICK

Pennsylvania	38.00
Joliet, Ill., East Chicago, Ind.	47.00
Birmingham, Ala.	50.00

MAGNESITE BRICK

Per Net Ton

9 x 4½ x 2½	$61.50

CHROME BRICK

Per Net Ton

F.o.b. shipping point	$42.50

MAGNESITE

Dead burned grain, net ton, Chester, Pa., or Baltimore bases	38.00
Domes, Chewelah, Wash., base	20.90

Semifinished Steel

Prices Per Gross Ton

BILLETS AND BLOOMS

4 x 4-inch base

Pittsburgh, open-hearth	$27.00
Pittsburgh, bessemer	27.00
Youngstown	27.00
Cleveland	27.00
Philadelphia	32.75
Chicago	28.00
Forging, Chicago	34.00 to 35.00
Forging, Pittsburgh	33.00 to 34.00
Forging, Philadelphia	38.75 to 39.75

SHEET BARS

Pittsburgh	26.00
Youngstown	26.00
Cleveland	26.00
Chicago	27.00

SLABS

Pittsburgh	27.00
Youngstown	27.00
Cleveland	27.00

WIRE RODS

Pittsburgh, Cleveland	$37.00
Chicago	36.00 to 38.00

SKELP

All grades, Pittsburgh	1.50c

Ferroalloys

(In dollars, except Ferrochrome)

*Ferromanganese, 78-82%, tidewater, duty paid	$75.00
*Ferromanganese, del. Pittsburgh	80.24
Spiegeleisen, 19-20%, domestic fur. spot†	27.00
Ferrosilicon, 50 per cent, freight all., c. l.	77.50
Do, less carload	85.00
Do, 75 per cent	126.00 to 136.00
Silicomang., 2½% carb.	105.00
2% carbon	110.00
1% carbon	115.00
(Spot prices, $5 a ton higher.)	
Ferrochrome, 60-70 chromium, 4-6 carbon, cts. lb. con. del.	10.00
Do, for spot delivery	10.50
Ferrotungsten, stand., lb. cont.	1.10 to 1.20
Ferrovanadium, 30-40 per cent, per lb. contained, on analysis	3.05 to 3.30
Ferrotitanium, c.l., prod. plant, frt. allow., net ton	137.50
Spot, 1 ton, frt., all., lb.	8.50
Do, under 1 ton	9.00
Ferrophosphorus, per ton, carload 17-19 per cent, Rockdale, Tenn., basis, (18 per cent)	85.00
Ferrophosphorus, electrolytic per ton carload, 23-26% f.o.b. Anniston, Ala.	113.50
Ferromolybdenum, stand. 50-60 per cent. per lb.	0.95
Cal. Molybdate, lb. cont.	0.80
Molyte, lb. cont.	.80

†Carloads. Differentials apply to quant.
*To users of carloads to 1000 tons annually. Differentials to large users.

Fluorspar

85 and 5 per cent grade

Washed gravel, domes., net ton, del. Pitts. equiv.	$20.31
Washed gravel, import duty paid tide. gross ton	19.50

Pig Iron

April Shipments Expected To Gain—Current Market Quiet—15,000 Tons of Iron Imported

PIG IRON PRICES, PAGE 66

Pittsburgh—Pig iron demand is fairly steady at an extremely low rate following a gradual decline during most of March. Shipments are near the lowest level in years and new business is confined to small individual lots. The market usually is $16, Pittsburgh, for No. 2 foundry, bessemer and malleable, with prices in competitive districts subject to concessions.

Boston— Pig iron sales are up slightly. The New England furnace now is averaging sales of 4000 tons a month and has reduced its stock pile 40,000 tons since going out. The local furnace is averaging $17 furnace while Buffalo and southern iron is unchanged at $14.50 and $10, furnace, respectively. Foreign iron by truck to nearby storage points has been sold close to $16. The New England Freight association has docketed a proposed reduction in pig iron rates, from $3.70 a gross ton to $2.50, on a minimum of 56,000 pounds, from Beacon, N. Y. (exbarge) to Wollaston, West Concord, Easton, Hyde Park, North Attleboro, Norwood and Randolph, Mass.

New York—At no time in the history of the local trade has pig iron business been less active. Buffalo and eastern Pennsylvania irons continue $14.50 to $15, furnace, with the lower figure the more representative.

Philadelphia—Ten thousand tons of foreign pig iron arrived in Philadelphia last week. Nine thousand tons is said to be English iron for a Delaware river pipemaker, and 1000 tons Dutch iron for various nearby foundries. A cargo of 5000 tons of English iron for the same pipemaker is scheduled to arrive April 8. Importations of foreign iron for the country as a whole in February totaled 5734 tons, of which 3200 tons was Dutch iron, according to figures just compiled. Eastern Pennsylvania iron is $14.50 to $15, base, furnace, most of the sales being made at $14.50.

Bids on 224 tons of foundry pig iron for the Norfolk navy yard March 29 brought out a low of $16.20, delivered.

Buffalo—Eastern business is dominated by foreign pig iron and producers here agree they cannot compete on price basis. The district price holds at $16, base, furnace.

Youngstown, O.—Pig iron continues to be sold in small lots at unchanged prices. No change is noted in blast furnace operations.

Cleveland—Currently the market is quieter, sales by furnace interests with headquarters in Cleveland having drifted downward in the past week to approximately 3000 tons. For April, however, business appears more encouraging. Pig iron producers are convinced their shipments to the automotive industry this month will improve substantially, and carry the total well over the March level. The movement of iron to automotive shops has been improving gradually for several weeks. In other lines there is no change; inquiries are few and small. Prices hold at $15.50, base, Cleveland furnace, for local shipment, and generally $15 for nearby delivery.

Cincinnati — Orders for pig iron during the past month disclosed almost no interest in second quarter coverage. The melt remains low, and buying is chiefly in small lots. An inquiry for 500 tons of northern iron for an Ohio consumer still is pending. Quotations on southern iron are firm, but demand is light.

Chicago—Contrary to earlier predictions, March merchant iron shipments failed to gain over February. A few malleable foundries have received releases for the automotive market. Individual negotiations continue to govern prices, offers of $16, base, being met occasionally on carloads. A small amount of resale iron has been offered. Preliminary estimates of needs of term buyers indicate heavier April shipments.

St. Louis—Some new business is expected to result from the opening of the Wabash locomotive shops at Decatur, Ill., giving employment to 1100. With open-hearth furnaces in this district operating at about 12 per cent the melt of basic iron is extremely limited. Operations at stove and other foundries also are light. Prices are unchanged.

Toronto, Ont.—Pig iron sales are restricted to single car lots. Sellers look for more active buying in the early future as bright spots have appeared in the industry indicating a growing demand for merchant iron.

Birmingham, Ala.—Carload orders have dominated the market for more than 18 months, and there is no indication of a change in policy for some time. Production still exceeds shipment. Prices are steady.

Ferroalloys Demand Shows Slight Gain

Ferroalloy Prices, Page 66

New York—Although demand for ferroalloys continues slow, a slight improvement in the volume of business in the past week is reported by leading sellers. The market is now approaching a period when a seasonal pickup may be expected. All ferroalloy prices are unchanged.

Pittsburgh—Shipments of ferromanganese and spiegeleisen reflect the unchanged rate of steelmaking operations and have varied but slightly over the past three months. Specifications for other ferroalloys also are in light and unchanged volume. Prices continue $75 for ferromanganese and $27 for spiegeleisen in small lots.

Chicago—Month-end specifications for ferroalloys boosted the total above recent weekly averages. Additional releases for Ford Motor Co. have been received. Prices are unchanged.

Semifinished Steel Moving in Small Lots

Semifinished Prices, Page 66

Pittsburgh—Semifinished steel orders and shipments are quiet and unchanged. March business declined moderately from the February volume. Spot orders are only for small lots and second quarter contracting has been light. Billets, sheet bars and slabs continue $26 to $27 with forging billets $33 to $34 and wire rods $37.

Philadelphia—Rerolling and forging billet prices enter the second quarter at unchanged levels. The market is quiet.

Youngstown, O.—With a slight expansion in sheet and strip mill operations there appears a better prospect for sheet bar and billet deliveries in April. Billets and slabs bring $27, Youngstown, Pittsburgh and Cleveland, and sheet bars $26.

Chicago — Semifinished steel is quiet. Shipments of sheet bars to the Detroit area have failed to pick up. Billets and blooms, 4 x 4-inch base, are quoted $28, Chicago. Sheet bars are unchanged at $27, Chicago.

Manufacturing firms in Los Angeles invested $19,000,000 in 95 new plants and 110 expansions during 1931.

Scrap

Nominal Prices Rule, with Some Adjustments Downward—Small Buying Is for Immediate Needs

Chicago — Strong resistance to lower prices has developed in the scrap market. Dealers are refusing to sell steelmaking grades under $7.25, despite sales negotiations. No heavy melting steel has been sold in the last two weeks. Dealers, due to scarcity of incoming material, are forced to buy melting steel at $7.25 to fill $7.25 orders. The mild upturn in steel ingot production the last three weeks has strengthened sentiment in the scrap market. Despite the fact that about five open hearths were scheduled to be taken off this week, dealers feel that shipments to larger melters will continue at a relatively high rate for a time, to cover expected demand for automotive steel.

Boston—Several scrap grades are

Iron and Steel Scrap Prices

Corrected to Friday night. Gross tons delivered to consumers, except where otherwise stated

HEAVY MELTING STEEL

Birmingham	7.00 to 7.50
Boston, dealers	4.00 to 4.25
Buffalo, No. 1	8.00
Buffalo, No. 2	6.25 to 6.50
Chicago	6.75 to 7.25
Cinci., deal.	6.75 to 7.25
Cleve., No. 1	7.25 to 7.75
Cleve., No. 2	7.00 to 7.50
Det., No. 1 deal.	5.75 to 6.25
Det., No. 2 deal.	4.00 to 4.50
E. Pa. del. mill	7.50
N. Y. deal. R. R.	4.50 to 5.00
N. Y. deal. No. 2	3.50 to 4.00
N. Y. deal. yd.	3.50 to 4.00
Pitts. No. 1	10.00 to 10.50
St. L. No. 1 sel.	7.00 to 7.50
Federal, Ill.	6.50 to 7.00
Granite City, Ill.	6.00 to 6.50
Valleys, No. 1	10.00

COMPRESSED SHEETS

Buffalo, dealers	6.25 to 6.50
Chi. (Factory)	5.75 to 6.25
Cleveland	7.00 to 7.25
Detroit, dealers	5.75 to 6.25
E. Pa. new mat.	6.50 to 7.50
Pittsburgh	9.75 to 10.25
Valleys	9.50 to 10.00

BUNDLED SHEETS

Buffalo	5.25 to 5.50
Cinci., deal.	6.00 to 6.50
Cleveland	6.00 to 6.50
Eastern Pa.	5.50 to 6.00
Pittsburgh	8.50 to 9.00
St. Louis	3.50 to 4.00

SHEET CLIPPINGS LOOSE

Chicago	3.50 to 4.00
Cincinnati	3.50 to 4.00
Detroit, dealers	3.00 to 3.75
St. Louis	3.50 to 4.00

STEEL RAILS SHORT

Birmingham	11.00 to 11.50
Boston, dealers	4.25 to 4.75
Buffalo	10.00 to 11.00
Chicago (3 ft.)	8.50 to 9.00
Chicago (2 ft.)	9.50 to 10.00
Cinci., deal.	10.50 to 11.00
Detroit, deal.	10.50 to 11.00
Pitts. (open-hearth, 3 ft. and less)	12.00 to 12.50
St. Louis	11.00 to 11.50

STOVE PLATE

Birmingham	6.50 to 7.00
Boston, con.	4.50 to 5.00
Buffalo	8.50 to 8.75
Chicago, net	5.75 to 6.25
Cinci., deal. net	4.00 to 4.50
Det., net deal.	3.00 to 3.50
Eastern Pa.	7.00
N. Y., deal. mill	4.00 to 4.50
St. Louis	6.50 to 7.00

COUPLERS, SPRINGS

Buffalo	9.75 to 10.25
Chicago	8.00 to 8.50
Eastern Pa.	8.50 to 9.50
Pittsburgh	10.50 to 11.00
St. Louis	8.00 to 8.50

ANGLE BARS—STEEL

Chicago	7.50 to 8.00
St. Louis	7.00 to 7.50

LOW PHOSPHORUS

Buffalo, billets and bloom crops	11.00 to 11.50
Cleveland bil. and bloom crops	14.00 to 14.50
Eastern Pa.	10.00 to 11.00
Pittsburgh billet bloom crops	14.00 to 14.50
Pitts., sheet bar crops	12.50 to 13.00

FROGS, SWITCHES

Chicago	6.75 to 7.25
St. Louis	7.50 to 8.00

SHOVELING STEEL

Chicago	6.75 to 7.25
Cleveland	6.25 to 6.50
St. Louis	6.50 to 7.00

RAILROAD WROUGHT

Birmingham	6.50 to 7.00
Boston, dealers	6.50 to 7.00
Buffalo, No. 1	5.00 to 5.50
Buffalo, No. 2	8.00
Chicago, No. 1	6.25 to 6.70
Chicago, No. 2	6.75 to 7.25
Cinci., No. 2	6.50 to 7.00
Eastern Pa.	8.00
N. Y., No. 1, deal.	5.00 to 5.50
Pitts., No. 2	10.00 to 10.50
St. Louis, No. 1	4.50 to 5.00
St. Louis, No. 2	6.50 to 7.00

SPECIFICATION PIPE

Boston	4.00 to 4.25
Eastern Pa.	8.50 to 9.50
N. Y., deal.	5.00 to 5.50

BUSHELING

Buffalo, No. 1	6.25 to 6.50
Chicago, No. 1	5.25 to 5.75
Cinn., No. 1 dl.	4.75 to 5.25
Cinn., No. 2	3.00 to 3.50
Cleve., No. 2	4.25 to 4.50
Det., No. 1 new deal.	5.00 to 5.50
St. L., No. 1	5.00 to 5.50
Val. new No. 1	9.00 to 9.50

MACHINE TURNINGS

Birmingham	3.50 to 4.00
Boston, dealers	1.05 to 1.55
Buffalo	4.75 to 5.25
Chicago	4.00 to 4.25
Cinn., deal.	3.25 to 3.75
Cleveland	4.00 to 4.50
Detroit	3.50 to 4.00
Eastern Pa.	4.00 to 4.50
N. Y., deal.	1.35 to 1.50
Pittsburgh	7.00 to 7.50
St. Louis	2.50 to 3.00
Valleys	7.25 to 7.75

BORINGS AND TURNINGS
For Blast Furnace Use

Boston, dealers	.90 to 1.10
Buffalo	6.00 to 6.25
Cinn., deal.	3.25 to 3.75
Cleveland	6.00 to 6.25
Detroit, deal.	4.00 to 4.50
Eastern Pa.	3.00 to 3.50
N. Y., deal.	1.35 to 1.50
Pittsburgh	6.75 to 7.25

CAST IRON BORINGS

Birming., chem.	12.50 to 13.00
Birming., plain	3.50 to 4.00
Boston, chem.	5.50 to 6.50
Boston, dealers	1.00 to 1.25
Buffalo	5.75 to 6.25
Chicago	4.50 to 5.00
Cinn., deal.	3.25 to 3.75
Cleveland	6.00 to 6.25
Detroit, deal.	4.00 to 4.50
Eastern Pa.	3.00 to 3.50
E. Pa., chem.	10.00 to 11.00
N. Y., deal.	1.50 to 2.00
Pittsburgh	6.75 to 7.25
St. Louis	5.00 to 5.50

PIPE AND FLUES

Cinn., deal.	4.00 to 4.50

RAILROAD GRATE BARS

Buffalo	5.25 to 5.75
Chicago, net	5.50 to 6.00
Cincinnati	4.50 to 5.00
Eastern Pa.	7.00
N. Y., deal.	4.00 to 4.50
St. Louis	5.25 to 5.75

FORGE FLASHINGS

Boston, dealers	3.00 to 3.50
Buffalo	6.25 to 6.50
Cleve. ov. 10 in.	7.00 to 7.50
Detroit	5.00 to 5.50

FORGE SCRAP

Boston, dealers	2.00 to 2.25
Chicago	9.50 to 10.00
Eastern Pa., del.	6.75

ARCH BARS, TRANSOMS

Chicago, net	6.25 to 6.75
St. Louis	6.50 to 7.00

AXLE TURNINGS

Boston, deal.	6.75 to 7.00
Buffalo	6.75 to 7.25
Chi., steelworks	5.75 to 6.25
Cleveland	6.75 to 7.00
Eastern Pa. del.	7.00 to 8.00
Pittsburgh, O. H.	8.50 to 9.00
St. Louis	5.00 to 5.50

STEEL CAR AXLES

Birmingham	11.00 to 11.50
Boston, ship. pt.	9.00 to 10.00
Buffalo	12.00 to 12.50
Chicago	11.25 to 11.75
Eastern Pa.	14.50 to 15.00
St. Louis	10.50 to 11.00

SHAFTING

Boston, ship, pt.	8.50 to 9.00
Chicago	7.30 to 7.85
N. Y., deal.	9.00 to 9.50
St. Louis	8.50 to 9.00
E. Penna.	13.00 to 14.00

CAR WHEELS

Birming. iron	8.00 to 9.00
Boston, iron	10.00 to 11.00
Buffalo, iron	9.25 to 9.75
Buffalo, steel	9.75 to 10.25
Chicago, iron	7.00 to 7.50
Chi., rolled steel	8.50 to 9.00
Cincinnati iron	8.50 to 9.00
E. Pa. steel	8.50 to 9.00
E. Pa. iron	9.50 to 10.00
Pitts. iron	10.00 to 10.25
Pitts., steel	10.50 to 11.00
St. Louis, iron	6.00 to 6.50
St. Louis, steel	6.50 to 7.00

NO. 1 CAST SCRAP

Birmingham	7.00 to 8.00
Buffalo (Mach.)	9.50 to 10.00
Buffalo, cupola	8.50 to 9.00
Boston, textile	7.50 to 8.00
Chicago, mach.	8.40 to 8.95
Chi., railroad	7.00 to 7.55
Chicago, agri.	6.45 to 7.00
Cinn., mach. cup.	8.50 to 9.00
Cleve. cupola	10.00 to 10.50
Det., net deal.	8.00 to 8.50
E. Pa. cupola	9.50 to 10.00
N. Y. cup. deal.	7.00 to 7.50
N. Y., del. local foundries	11.00
Pitts., cupola	9.50 to 10.00
San Fran., del.	13.50 to 14.00
Seattle	5.00 to 7.50
St. L. No. 1 ma.	7.00 to 7.50
St. L., No. 1	6.50 to 7.00

HEAVY CAST

Boston, del.	4.00 to 4.25
Bost., mach. cast	7.50 to 8.00
Buffalo, break.	8.00 to 8.50
Cleve., break	6.00 to 6.50
Detroit, auto, net deal.	10.00 to 10.50
Det., break., dl.	4.75 to 5.25
Eastern Pa.	9.00
N. Y. No. 1 dl.	6.00 to 6.25
N. Y. break, dl.	5.00 to 5.25
Pittsburgh	8.00 to 8.50

MALLEABLE

Boston R. R.	8.00 to 8.50
Buffalo	9.00 to 9.50
Chicago, agri.	6.50 to 7.00
Chicago, R. R.	6.50 to 7.00
Cinci., R. R. del.	8.75 to 9.25
Cinci., agri. del.	8.50 to 9.00
Cleveland, rail	10.00 to 10.50
Det. auto deal.	9.00 to 9.50
St. Louis, rail	5.50 to 6.00

RAILS FOR ROLLING
5 feet and over

Birmingham	9.00 to 10.00
Boston, deal.	5.50 to 6.00
Buffalo	8.50 to 9.00
Chicago	9.50 to 10.00
Eastern Pa.	9.50 to 10.00
New York	6.00 to 6.50
St. Louis	9.00 to 9.50

LOCOMOTIVE TIRES

Chicago, cut	8.00 to 8.50
St. L., No. 1	8.00 to 8.50

LOW PHOS. PUNCHINGS

Chicago	9.50 to 10.00
Buffalo	10.00 to 11.00
Eastern Pa.	10.00 to 11.00
Pittsburgh	11.00 to 11.50

easier on limited shipments. Several grades are off 25 cents a ton, chemical cast iron borings being contrary to the trend. Bids of $4.00 for heavy melting steel, with the lower freight to Worcester, lowered the delivered price at that point to $6.00 and $6.25 while little better than $4.50 delivered is possible on bundled skeleton.

New York—Approximately 15,000 tons, mostly No. 1 and No. 2 melting steel will move to the Buffalo district when the barge season opens, which is expected any day. Little No. 1 scrap is moving to the Pittsburgh district, but $4.50 holds on the limited shipments to that district.

Philadelphia—Nominal reductions have been made in several grades of steel and iron scrap. General buying is scattered.

Buffalo—Dealers report no change in the scrap situation. While some nominal quotations have declined slightly the trade contends there is no justification for downward revision until sales are made.

Pittsburgh—One interest has purchased about 10,000 tons of heavy melting steel for several points in the district, paying $10.25 to $10.50. This represents no change from the previous purchase, and although one consumer recently bought a small lot at $10 the market continues $10 to $10.50.

Detroit—Iron and steel scrap market has lapsed into an even more stagnant condition. Offerings by automobile manufacturers continue at about the same level as a month ago, with consumer demand both locally and from the Pittsburgh, Cleveland and Youngstown districts slightly easier. The few turnings coming out are being stored. Prices generally are unchanged, except that a range of $5 to $5.50 is more representative of No. 1 busheling.

Cleveland—Practically no movement of steel and iron scrap is apparent, operations of consumers being too low to require further supplies. Prices are nominally and untested. Valley interests are also dull.

Cincinnati—Buying of small lots with light shipments against contracts comprise the chief activity in the scrap iron and steel market here.

St. Louis—The iron and steel scrap market continues at a low ebb. Although stocks of mills are low no immediate buying is in prospect, because of low order files. Prices for the most part are nominally unchanged.

Birmingham, Ala.—Sales of scrap are few and tonnage small. Supply is ample for all needs.

Toronto, Ont.—Sales of steel scrap are beginning to pick up. Mills are not buying except in special grades and the movement of steel scrap is negligible. Special iron grades are responsible for most new business and dealers report a steady flow of small orders for machinery cast, with odd sales of wrought scrap, stove plate and malleable. Prices are unchanged.

Canadian Scrap

Dealers' Buying Prices

Per Gross Ton

MONTREAL

Iron axles	$11.00
Steel axles	10.00
Car wheels	8.00
Stove plate	8.00
Wrought pipe	2.00
Turnings	2.00
Heavy melting steel	6.00

TORONTO

Steel axles	7.00
Iron axles	7.00
Heavy melting steel	7.00
Turnings	2.00
No. 1 mach. cast (net)	9.00
Malleable (net)	7.00

For Deeper Barge Canal

The New York chapter of the Institute of Scrap Iron and Steel Inc. is supporting a bill in the United States senate appropriating $50,000,000 for improving the New York state barge canal. As much as 100,000 tons of scrap has moved from the metropolitan district of New York to Buffalo in one season, this movement being handicapped at times by limited bridge clearance and shoal water.

Railroads Accept Changes In Scrap Sale Methods

Scrap committee of the American Railway association has accepted recommendations proposed by the railroad scrap committee of the Institute of Scrap Iron and Steel Inc. in relation to award and sale of railroad scrap. The committee report will be presented at the annual meeting of the association and on approval will be incorporated in scrap contracts of the railroads.

The changes include the provision that shipments be made within 30 days after shipping instructions, which shall be issued within ten days of notice of award; claims for apparent shortages of 1000 pounds or over will be considered, under certain conditions; net ton basis shall be standard; offers of more than one car shall be in tonnages; cars to be light-weighed and uncoupled; awards to be made within 48 hours of closing; wherever possible scrap to be loaded to minimum carload switching weights. Several changes proposed in classification were also accepted.

The Pennsylvania railroad will put into effect at once the provision for claims for shortages of 1000 pounds.

Coke

Market Is Quieter as Demand for Heating Fuel Subsides—Prices Carry Into New Quarter

COKE PRICES, PAGE 66

Pittsburgh—Coke business is subject to fluctuations occasioned by the trend in demand for heating fuel. Activity in this grade which had been fairly steady recently now is tending downward while business in the furnace and foundry grades is quiet and unchanged. The market continues $2.25 for beehive furnace coke and $3.25 to $4.50 for standard grades of foundry coke.

New York—Metallurgical coke is moving more slowly. Prices on the more standard grades of beehive furnace coke are unchanged at $2.50 to $2.75, Connellsville, Pa., with some coke offered at $2. Standard grades of beehive foundry coke are $3 to $3.50, Connellsville, and premium brands, $4 to $4.50, Latrobe, Pa. The lower price is said to apply to material on cars at ovens which have been closed. By-product foundry coke is moving slowly at $8.76 to $9.16, delivered, Newark, N. J.; $10.50, New England; and $8.75, Philadelphia.

Cincinnati—Specifications for by-product foundry coke show no improvement. Reduced prices on domestic grades are expected to increase demand during spring months.

Birmingham, Ala.—Shipment of coke to other districts continues fairly good. Production is around 50 per cent of normal.

Mill Products

Base price cents per pound f.o.b. mill except otherwise specified. Copper and brass product prices based on 6.25c, Conn., for copper

Sheets	
Yellow brass (high)	12.50
Copper, hot rolled	15.37½
Lead sheets, cut, to jobbers	6.50
Zinc sheet (100-lb. base)	9.00
Tubes and Pipes	
Seamless yellow brass (high)	15.75
Seamless copper	14.87½
Rods	
Yellow brass (high, full turnings)	10.25
Naval brass	11.37½
Anodes	
Copper untrimmed	12.25
Wire	
Yellow brass (high)	12.50

Old Metals

Dealers' buying prices, cents lb. No. 1 Composition Red Brass

New York	3.25 to 3.50
Chicago	2.75 to 3.00
Cleveland	3.00 to 3.25
St. Louis	2.75
Heavy Yellow Brass	
New York	2.00 to 2.25
Heavy Copper and Wire	
New York	4.00 to 4.25
Boston	4.50 to 4.75
Chicago	2.50 to 3.00
Cleveland	3.25 to 3.50
St. Louis	3.00
Composition Brass Borings	
New York	3.00 to 3.25
Yellow Brass Tubing	
Cleveland	1.50 to 2.00
Light Copper	
New York	3.25 to 3.50
Chicago	2.50 to 2.75
Cleveland	2.75 to 3.00
St. Louis	2.75
Light Brass	
Boston	1.65 to 1.85
Chicago	1.25 to 1.50
Cleveland	1.25 to 1.50
St. Louis	1.50
Lead	
St. Louis	2.00
Zinc	
New York	1.00
Cleveland	1.00 to 1.12½
St. Louis	1.00
Aluminum	
Clippings, new, soft, Cleve.	11.00 to 11.50
Clippings, hard, Cleveland	7.50 to 9.00
Borings, Cleveland	2.75 to 3.25
Mixed cast, Cleveland	4.00 to 4.75
Mixed cast, Boston	3.25 to 3.50
Mixed cast, St. Louis	3.50 to 4.00

Secondary Metals

Remelt, aluminum No. 12	8.00 to 9.00
Brass ingots, 85-5-5-5	6.25

Metals

Sentiment Improves in Copper But Demand Lags—Lead Is More Active—Zinc Firmer

New York—Most metals showed a fairly steady price tone last week with the exception of tin. Lead buying was in fair volume but consumers continued to show little interest in other metals.

Copper — Sentiment in copper showed further improvement last week due to further production curtailment by world producers. Leading interests had cut production to 20 per cent or less by April 1 and it was estimated that the average for the industry would probably be near 15 per cent. Stocks are expected to be reduced by at least 15,000 tons this month. Despite the improved position of the market, purchases by both domestic and foreign consumers were light. Both custom smelters and mine producers were quoting copper on the single basis of 6.00c, delivered Connecticut. No shading by resellers was reported. Copper and brass products held unchanged. Scrap was dull but fairly steady.

Lead — Business picked up last week with all classes of consumers well represented in the market. Buyers showed an increased tendency to book metal for delivery farther ahead, some orders being placed for May delivery. Bulk of the business was for April shipment and needs for that month are estimated to be about 60 per cent covered. Prices remained at the low levels of 1896.

Zinc—Prices firmed up somewhat due to reports that production is to be cut even further. At the end of the week most sellers were reluctant to dispose of metal at less than 2.80c, East St. Louis. Demand continued limited, particularly from galvanizers.

Tin—Quotations eased off with metal available at the end of the week nearly two cents a pound under the level of a week previously. Much uncertainty developed in the market due to fluctuations in sterling exchange and declines on the London Metal exchange. Fair business for prompt shipment was done on some days although most of this was at under usual importers' costs. A few carlots for future delivery also were sold.

Antimony — The price held unchanged at 6.12½c, duty paid. Business, however, continued of recent dull proportions.

Aluminum—Sales were light with prices steady. Aluminum Co. of America had profit of $3,910,053 last year, against $11,672,727 in 1930.

By-Products More in Demand; Phenol Easier

New York—Coke by-products are more active with the exception of phenol. Sulphate of ammonia is selling heavily to fertilizer and chemical consumers. Contract and spot business is active at $22 a ton, Atlantic seaboard, for domestic. Toluol and xylol are moving better, largely to the lacquer trade, reflecting more activity in automobile finishes. Naphthalene shipments against contracts are heavier and some spot business is being taken. Phenol prices have been readjusted downward, larger drums moving at 15.3c, the range going to 17.3c, depending on quantity.

Coke By-Products

Per Gallon, Producers' Plants, Tank Lots

	Spot
Pure benzol	$0.20
90 per cent benzol	0.20
Toluol	0.30
Solvent naphtha	0.26
Commercial xylol	0.26

Per Pound at Producers' Plants in 250-Pound Drums

Phenol	0.153 to 0.173

Per Pound at Producers' Plants in

Naphthalene flakes	3.75 to 4.75
Naphthalene balls	4.75 to 5.75

Per 100 Pounds Atlantic Seaboard

Sulphate of ammonia	$1.10

Prices of the Week, Cents a Pound

	Copper—Electro delivered	Copper—Lake delivered	Copper—Casting refinery	Straits Tin New York Spot	Straits Tin New York Futures	Lead N. Y.	Lead East St. L.	Zinc St. L.	Aluminum 98-99%	Spot Antimony	Ingot Nickel
March 26	6.00	6.12½	5.75	22.00	22.35	3.00	2.90	2.75	22.90	6.12½	35.00
March 28	6.00	6.12½	5.75	21.87½	22.25	3.00	2.90	2.77½	22.90	6.12½	35.00
March 29	6.00	6.12½	5.75	21.12½	21.45	3.00	2.90	2.77½	22.90	6.12½	35.00
March 30	6.00	6.12½	5.75	21.20	21.50	3.00	2.90	2.80	22.90	6.12½	35.00
March 31	6.00	6.12½	5.75	20.75	21.05	3.00	2.90	2.80	22.90	6.12½	35.00
April 1	6.00	6.12½	5.75	20.30	20.80	3.00	2.90	2.80	22.90	6.12½	35.00

Pacific Coast

Slight Betterment in Demand as Spring Advances—Public Work Supplies Nearly All Buying—Large Gas Pipe Line Not Yet Placed—Cast Pipe Lettings Are Few and Slow—Prices Steady

San Francisco—(*By Air Mail*)—Demand generally has shown little improvement during the past month. Several cast iron pipe tonnages are pending and bids will be called for this summer for 60,000 to 70,000 tons of plates for tunnel lining at the Hoover dam, Boulder City, Nev.

Blue Diamond Co. booked 150 tons for a bridge for Los Angeles. New inquiries include 500 tons for a waterfront project at Stockton, Calif., bids on which open April 4. This work will also require 600 tons of structural shapes and 125 tons of rails. Bids have been opened on 230 tons and 113 tons for highway work in California. Mild steel bars are quoted at 2.00c, c.i.f., while out-of-stock prices on reinforcing bars in the San Francisco district hold at 2.60c, base, on carload lots. Los Angeles quotations are still weak at 1.90c.

Western Pipe & Steel Co. booked 254 tons for a 45-inch welded pipe line for Los Angeles. No action has yet been taken on 9000 to 10,000 tons for a 28-inch pipe line for the Pacific Gas & Electric Co. Plate prices remain unchanged at 1.80c, c.i.f.

Structural awards included 300 tons for a Federal building at Butte, Mont., secured by McClintic-Marshall Corp., 115 tons for a high school in Beverly Hills, Calif., taken by the Pacific Iron & Steel Co., and 100 tons for an armory at Salinas, Calif., placed with the Moore Drydock Co.

Only two cast iron pipe awards were noted. The United States Pipe & Foundry Co. booked 234 tons for Ben Lomond, Calif. R. D. Wood & Co. were low bidders on 598 tons for Glendale, Calif., and the United States Pipe & Foundry Co. was low on 555 tons for Oakland, Calif. San Diego, Calif., is in the market for 248 tons. The Southern Counties Gas Co., San Diego. Calif., will shortly be in the market for 60 to 70 miles of 12¾-inch pipe for a line between Long Beach and San Diego.

Bridges Give Tonnage

Seattle—The general market situation in the Pacific Northwest is unchanged. Public projects are active, industrial work dormant. Oregon will award $2,500,000 in highway jobs prior to June 2. Last week Washington let road contracts totaling $350,000. Puget Sound Navy yard is increasing skilled personnel.

Awards last week were nearly 2000 tons, the largest, 1000 tons of shapes for the Clackamas river bridge, Oregon, going to Poole & McGonigle, Portland, Linstrom & Feigenson, Portland, general contractors. Unnamed eastern interests are reported to have booked 300 tons, including some cast steel and reinforcing, for the Mineral county bridge, in Montana.

Some Reinforcing Sold

Reinforcing awards include 382 tons to Northwest Steel Rolling Mills, Seattle, for state paving work in Eastern Washington and a state bridge over the Okanogan river. Pacific Coast Steel Corp., Seattle, will furnish 162 tons for the East Marginal Way viaduct, Seattle.

Steel in Europe

Better Sales Appear in Britain And on the Continent

London—(*By Cable*)—Dullness in trade has caused many works to extend the Easter closing period. The West Coast presents the brightest spot, with larger pig iron sales. Railroads at home and on the Continent are beginning to place orders. British firms hope to obtain the contract for a 150,000-ton pipe line in the Near East, but foreign firms are giving strong competition. Galvanized sheets and tin plates are quiet. The Continent reports prices are weakening further. Orders are being received from Shanghai for cheap material. From Germany comes report of a 300,000-ton Russian contract for steel and sales of 8000 tons of steel to American importers.

Current Iron and Steel Prices of Europe

Dollars at Rates of Exchange, March 31

Export Prices f.o.b. Ship at Port of Dispatch—By Cable (or Radio)

	British gross tons U. K. ports		Continental Channel or North Sea ports, metric tons Gold parity, $4.8665	
PIG IRON	£ s d		£ s d	L s d
Foundry, 2.50-3.00 Silicon	$11.17	2 18 6	$ 9.72 to $10.21	2 0 0 to 2 2 0
Basic bessemer	10.70	2 16 0*	8.75 to 9.23	1 16 0 to 1 18 0
Hematite, Phos. .03-.05	12.22	3 4 0	.....	.....
SEMIFINISHED STEEL				
Billets	$20.53	5 7 6	$10.69	2 4 0
Wire rods, No. 5 gage	32.47	8 10 0	24.30 to 25.52	5 0 0 to 5 5 0
FINISHED STEEL				
Standard rails	$31.52	8 5 0	$28.55	5 17 6
Merchant bars	1.20c	7 0 0	.52c	2 7 0
Structural shapes	1.33c	7 15 0	.51c to .52c	2 6 0 to 2 7 0
Plates, †¼ in. or 5 mm.	1.50c	8 15 0	.63c to .64c	2 17 0 to 2 18 0
Sheets, black, 24 gage or 0.5 mm.	1.50c	8 15 0	1.27c to 1.29c	5 15 0 to 5 17 6
Sheets, gal., 24 gage, corr.	1.62c	9 10 0	1.54c	7 0 0
Bands and strips	1.62c	9 10 0	.74c to .77c	3 7 6 to 3 10 0
Plain wire, base	1.45c	8 10 0	1.18c	5 7 6
Galvanized wire, base	1.88c	11 0 0	1.38c to 1.40c	6 5 6 to 6 7 6
Wire nails, base	1.88c	11 0 0	1.21c	5 10 0
Tin plate, box 108 lbs.	$ 3.06	0 16 0	$3.20	0 13 2

British ferromanganese $72 to $75 delivered Atlantic seaboard, duty-paid. German ferromanganese £9 0s 0d ($43.74) f.o.b.

Domestic Prices at Works or Furnace—Last Reported

	£ s d		French Francs		Belgian Francs		Reich Marks	
Fdy. pig iron, Si. 2.5	$11.17	2 18 6	$ 9.46	240	$ 9.49	340	$16.46	69
Basic bessemer pig iron	10.70	2 16 0*	7.88	200	8.65	310	18.01	75.50
Furnace coke	2.53	0 13 3	5.08	129	4.46	160	5.11	21.40
Billets	20.53	5 7 6	12.21	310	11.30	405	23.74	99.50
Standard rails	1.41c	8 5 0	1.41c	785	1.57c	1,210	1.37c	127
Merchant bars	1.20c	7 0 0	.90c	500	.61c	470	1.24c	115
Structural shapes	1.50c	8 15 0	.99c	550	.60c	460	1.22c	112.50
Plates, †¼-in. or 5 mm.	1.54c	9 0 0	1.17c	650	.74c	570	1.43c	132
Sheets, black	1.50c	8 15 0§	1.35c	750‡	.88c	675‡	1.56c	144‡
Sheets, galv., corr., 24 ga. or 0.5 mm	1.62c	9 10 0	2.70c	1500	1.95c	1,500	4.00c	370
Plain wire	1.45c	8 10 0	1.75c	970	1.95c	1,500	1.92c	178
Bands and strips	1.62c	9 10 0	.90c	500	.88c	675	1.44c	133

*Basic. †British ship-plates, Continental, bridge plates. §24 ga. ‡1 to 3 mm. basis price.
British quotations are for basic open-hearth steel, Continental usually for basic-bessemer steel.

Machinery

WHILE intensive sales efforts of automobile builders beginning this week may lead to purchases of new machinery and equipment, it will be some time probably before this movement materializes, even conceding that active automobile buying by the public gets under way. First quarter sales in most districts paint gloomy pictures, with March totals off from the two preceding months. Bids are being received and some awards being made on government equipment. Some interest is being manifested in used tools in the Chicago district. Tractor plants generally have abandoned plans for equipment purchases, many being shut down.

New York—Equipment buying and inquiry is listless. Volume with builders and dealers is light and limited to a scattering of tools. March with most builders shows little, if any, increase over the previous month, slowing up the last half. There is a decided spurt, however, in the demand for government needs, bids closing April 19 on shapers, upright drills, grinders, milling machines and lathes for various eastern and western points, there being about 35 units in all. Awards are also being made for government tools on which bids have been pending for some weeks, Reed-Prentice Corp., Worcester, Mass., receiving the award for engine lathes for Philadelphia.

Worcester, Mass.—April opens with dismal prospects in the New England machinery market. New inquiry is negligible but occasional revival of old prospects maintains some interest.

Most Worcester manufacturers look to Ford for whatever business may be in prospect in the coming month. Worcester-made machines play important parts in the Ford production system and several builders look forward to high production for the repeat orders that will be forthcoming if manufacture at Detroit gets under way on a quantity basis.

Rumors here are that in spite of a general move to hold prices at stationary levels, some buyers are seeking concessions on stock models already built and wearing away on assembly floors.

Pittsburgh—With the exception of orders for equipment by the local board of education, business in machine tools still is confined to individual purchases, with no change noted in total volume of business. Orders placed for local schools involved two shapers, one drill press and 14 small engine lathes. Inquiry is slightly more active than awards but there is no indication of how soon action will be taken on such work. The larger interests, including Westinghouse Electric & Mfg. Co. and the steel companies, are buying cautiously and what orders are being received usually are for small amounts. Dealers look for but little improvement in business prior to a general upturn in industrial activity.

Cleveland—Sales of machinery and equipment for March show a decrease in most cases from January and February totals, contributing to make the first quarter one of the poorest on record. Activity in Akron and Youngstown districts has fallen off and dealers here are admittedly unable to detect any signs of immediate improvement. A builder in this city last week booked an order for a large open-side planer to be shipped to the Turners Falls plant of the International Paper Co.

Chicago—More interest is shown in resale offerings and auctions of plant equipment and machine tools than in programs involving new orders. Used tool inquiry remains fairly active. About $25,000 in production and machine shop equipment of the Jewel Electrical Instrument Co. is being sold privately, as only a small amount of that company's equipment will be moved to the Newark, N. J., plant of Weston Electrical Instrument Corp., which purchased the Jewel company. Several dealers have bought tools offered at this private sale. The farm implement and tractor works in this area have abandoned all new equipment plans for the immediate future. Tractor plants generally are down, including even industrial tractor production. March is closing the poorest first quarter sales period in recent years. Only one or two dealers report March business even on a par with February. For most houses, March showed a sales loss from both January and February.

Several builders here are rushing work to complete orders for Ford. Novo Engine Co., Lansing, Mich., recently booked an order for 22 electric hoists ranging from 1500 to 25,000 pounds capacity, for the James Stewart Corp., Chicago.

Oil Pressure Tops Steel

New Orleans—Speaking of the great pressures required in petroleum cracking processes, Dr. R. T. Haslam, New York, vice president, Standard Oil Development Co., stated during the American Chemical society meeting, March 29, that "in many cases the strength possibilities of steel have been reached and passed, and it is now necessary to produce materials three times as strong as steel, in order to maintain the proper margin of safety in equipment."

Exports of Metalworking Machinery

	February		Two Months Ending February	
	1932	1931	1932	1931
Engine lathes	23	43	30	90
Turret lathes	5	14	10	40
Other lathes	16	69	33	116
Vertical boring mills and chucking machines	8	14	14	30
Thread-cutting and automatic screw machines	5	18	16	35
Knee and column type milling machines	7	4	7	12
Other milling machines	19	9	24	39
Gear-cutting machines	14	13	19	25
Vertical drilling machines	6	28	13	43
Radial drilling machines	.....	6	1	17
Other drilling machines	18	529	31	599
Planers and shapers	18	14	30	50
Surface grinding machines	11	12	26	21
External cylindrical grinding machines	21	20	26	33
Internal grinding machines	13	69	22	80
Tool grinding, cutter grinding, and universal grinding machines	38	63	64	160
Pneumatic portable tools	453	750	808	1,635
Chucks for machines tools	892	965	1,083	1,424

When the Emergency comes—

rely on GOOD alloy steel to meet the test

ILLINOIS *alloy* STEEL

ALWAYS DEPENDABLE

Controlled production of Illinois Alloy Steel means controlled quality in every heat.

Illinois Steel Company

SUBSIDIARY OF UNITED STATES STEEL CORPORATION

208 South La Salle Street, Chicago, Illinois

Steel, Wrought and Cast Iron Pipe, and Tubing

Welded Iron, Steel Pipe

Base Price $200 Ton

Base Discounts on steel pipe, Pittsburgh and Lorain, O., to jobbers in carloads. Indiana Harbor, Ind., and Evanston, Ill., 2 points less. Chicago del., 2½ points less. Wrought pipe, Pittsburgh base.

BUTT WELD

	Steel			Iron	
In.		Blk.	Gal.	Blk.	Gal.
⅛		58	44½	25	7
¼		62	50½	30	13
1—3		64	52½	33	17
1½—2				37	20

LAP WELD

2	57	45½	25	11
2½—6	61	49½	2½—3½ ..30	15
7—8	58	45½	4—6	19
9—10	56	43½	7—8	18
11—12	55	42½	9—12	13

BUTT WELD

Extra strong, plain ends

⅛	55	44½	¼ & ⅜	+11 +46
¼	60	49½	½	25 9
1—1½	62	51½	¾	30 14
2—3	63	52½	1—2	36 20

LAP WELD

Extra strong, plain ends

2	55	44½	2	31 15
2½—4	59	48½	2½—4	36 22
4½—6	58	47½	4½—6	35 21
7—8	54	41½	7—8	33 19
9—10	47	34½	9—12	23 10
11—12	46	33½		

To large jobbers these discounts on steel pipe increased on black by 1 point and two discounts of 5 per cent; on galvanized by 1½ points with two 5 per cents. Direct mill shipments, base, 5 and 2½. On iron pipe large jobbers obtain additional discount of 1 point with 5 and 2½ per cent on black and galvanized.

BOILER TUBES

Carload discounts, f.o.b. Pittsburgh

Lap Welded Steel		Charcoal Iron	
2—2¼	38	1¾	8
2½—2¾	46	2—2¼	13
3	52	2½—2¾	16
3¼—3¾	54	3	17
4	57	3¾—3½	18
4½—6	46	4	20
1½	1	4½	21

On lots of a carload or more, above base discounts subject to preferential of two 5 per cent discounts on steel and 10 per cent on charcoal iron. Smaller quantities subject to following modifications from base discounts.

Lap Welded Steel—Under 10,000 pounds, 6 points under base and one 5 per cent; on 10,000 pounds to carload, 4 points under base and one 5 per cent; on 10,000 pounds to carload, 4 points under base and two 5 per cents. Charcoal Iron—under 10,000 pounds, 2 points under base; on 10,000 pounds to carload, base and one 5 per cent.

STANDARD COMMERCIAL SEAMLESS BOILER TUBES

COLD DRAWN

1 inch	61	3	46
1¼—1½	53	3¼—3½	48
1¾	37	4	51
2—2¼	32	4½, 5, 6	40
2½—2¾	40		

HOT ROLLED

2—2¼	38	3¼—3½	54
2½—2¾	46	4	57
3	52	4½ 5, 6	46

Subject to 5 per cent supplementary discount for carload lots. On less than 10,000 pounds, base discount reduced 6 points. On 10,000 pounds to carload, base discount reduced 4 points and one 5 per cent allowed. No extra for lengths up to and including 24 feet. Sizes smaller than 1 inch and lighter than standard gage to be held at mechanical tubes list and discount. Intermediate sizes and gages not listed take price of next larger outside diameter and heavier gage.

Seamless Tubing

Cold drawn; f.o.b. mill discounts

Random lengths over 5 ft. 55%
Selected lengths, 1—18 ft. 53%

Cast Iron Water Pipe

Class B Pipe—Per Net Ton

Six-inch and over, Bir. ....$32.00 to 33.00
Four-inch, Birmingham .... 36.00 to 37.00
Four-inch, Chicago ..... 38.40 to 42.40
Six to 24-inch, Chicago .... 34.40 to 38.40
Six-inch and over, N. Y..... 28.00 to 30.00
Four-inch, New York ..... 34.50 to 36.50
Stand. fittings, Bir. base.... $100.00

Six to 24-inch, base; over 24-inch plus $20; 4-inch, plus $10; 3-inch plus $20; gas pipe fittings, $5 higher. Class A pipe $4 higher than Class B.

Warehouse Quotations at Leading Centers, in Cents Per Pound

(All Philadelphia prices subject to quantity differentials except reinforcing and Swedish bars)

STEEL BARS

Baltimore	2.75c
Boston	3.25c
Buffalo	3.00c
Chattanooga	3.00c
Chicago	2.75c
Cincinnati	3.00c
Cleveland	2.75c
Detroit	2.85c
Houston	2.65c
Los. Ang.	2.35c
New York‡(d)	3.10c
Philadelphia	2.45c
Pittsburgh	2.60c
Portland	2.75c
San Fran.	2.35c
Seattle	2.75c
St. Louis	3.00c
St. Paul	3.00c
Tulsa	3.25c

IRON BARS

Baltimore	2.75c
Boston	3.25c
Buffalo	3.15c
Chattanooga	3.00c
Chicago	2.75c
Cincinnati	3.00c
Detroit	2.85c
New York‡(d)	3.10c
Philadelphia	2.45c
St. Louis	3.00c
Tulsa	3.25c

REINFORC. BARS

Baltimore	2.35c-3.00c
Boston	3.25c
Buffalo	2.95c
Chattanooga	3.00c
Cincinnati	3.00c
Cleveland	2.10-2.25c
Detroit	2.85c
Houston	3.00c
Los. Ang. cl...	1.90c
Los Ang., lcl	2.20c
New York	2.65c-3.10c
Phila.	2.26½c
Pittsburgh	2.60c
San Fran. cl.	2.60c
San Fran. lcl	2.80c
Seattle	3.00c
St Louis	3.15c
Tulsa	3.25c
Young.	2.30c-2.60c

SHAPES

Baltimore	2.75c
Boston	3.35c
Buffalo	3.25c
Chattanooga	3.20c
Chicago	3.00c
Cincinnati	3.25c
Cleveland	2.95c
Detroit	3.10c
Houston	3.25c
Los. Ang.	2.35c
New York(d)	3.10c
Philadelphia	2.45c
Pittsburgh	2.85c
Portland	2.75c
San Fran.	2.35c
Seattle	2.75c
St. Louis	3.25c
St. Paul	3.10c
Tulsa	3.50c

PLATES

Baltimore	2.75c
Boston	3.35c
Buffalo	3.25c
Chattanooga	3.20c
Chicago	3.00c
Cincinnati	3.25c
Cleveland, ¼-in. and thicker	2.95c
Clev., 3/16-in.	3.20c
Detroit	3.10c
Det., 3/16-in.	3.10c
Houston	3.00c
Los Angeles	2.35c
New York(d)	3.30c
Philadelphia	2.45c
Phila. floor	5.10c
Pittsburgh	2.85c
Portland	2.75c
San Fran.	2.35c
Seattle	2.75c
St. Louis	3.25c
St. Paul	3.10c
Tulsa	3.50c

NO. 10 BLUE

Baltimore	3.25c
Boston	3.50c
Buffalo	3.50c
Chattanooga	3.50c
Chicago	3.20c
Cincinnati	3.30c
Cleveland	3.00c
Detroit	3.35c
Houston	3.35c
Los Ang.	3.50c
N. Y.	3.00c
Portland	3.75c
Phila.*† (e)	2.90c
Pitts.**	3.00c to 3.10c
San Fran.	3.50c
Seattle	3.75c
St. Louis	3.45c
St. Paul	3.40c
Tulsa	3.70c

NO. 24 BLACK

Balt.*†	3.50c
Boston	4.20c
Buffalo	4.10c
Chattanooga	3.65c
Chicago	3.55c
Cincinnati	3.75c
Cleveland	3.25c
Detroit	3.50c
Los Ang.	4.05c
New York	3.50c-3.65c
Phila.*†(e)	3.40c
Pitts.**	3.40c
Portland	4.25c
San Fran.	3.95c
Seattle	4.25c
St. Louis	3.80c
St. Paul	3.545c
Tulsa	4.75c

NO. 24 GAL. SHEETS

Balt.*†	4.00c
Boston	4.75c
Buffalo	4.35c
Chattanooga	3.95c
Chicago	4.10c
Cincinnati	4.25c
Cleveland	3.75c
Detroit	4.00c
Houston	4.25c
Los. Ang.	4.35c
New York	4.00c-4.10c
Phila.*†(e)	3.50c
Pitts.**	3.90c
Portland	4.75c
San Fran.	4.35c
Seattle	4.75c
St. Louis	4.35c
St. Paul	4.23c
Tulsa	5.10c

BANDS

Baltimore	3.25c
Boston	3.75c
Buffalo	3.35c
Chattanooga	3.20c
Chicago	2.95c
Cincinnati	3.20c
Cleveland	3.00c
Det. 3/16-in. & lighter	3.15c
Houston	3.65c
Los Ang.	4.30c
New York(d)	3.40c
Philadelphia	2.75c
Pittsburgh	2.95c
Portland	3.25c
San Fran.	3.75c
Seattle	3.25c
St. Paul	3.75c
Tulsa	3.45c

HOOPS

Baltimore	3.25c
Boston	4.90c-5.40c
Buffalo	3.90c
Chicago	3.50c
Cincinnati	3.75c
Cleveland	3.55c
Det. No. 14 & lighter	3.65c
New York	3.75c
Philadelphia	3.00c
Pittsburgh	3.60c
Seattle	4.75c
St. Paul	3.75c

COLD FIN. STEEL

Rounds & Hexagons

Baltimore (c)	3.30c
Boston	3.50c
Buffalo	3.15c
Chattanooga*	3.75c
Chicago	3.10c
Cincinnati	3.50c
Cleveland	3.10c
Detroit	3.40c
Los Ang. (a)	4.50c
New York	3.30c
Philadelphia*	3.30c
Pittsburgh	3.10c
Portland (a)	4.50c
San Fran.(a)	4.25c
Seattle (a)	4.50c
St. Paul (a)	3.85c
St. Louis	3.35c
Tulsa	4.65c

Flats and squares 50c extra, except Tulsa, where 5.14c is quoted. (a) Rounds, hex. only.

COLD ROLL. STRIP

Boston 0.100 in., 500 lb. lots	5.30c
Buffalo	5.25c
Chicago (soft) (b)	5.65c
Cincinnati	5.80c
Cleve. (b)	5.55c
Detroit	5.40c
Phila. (c)	4.55c
New York	4.55c

(b) Net base straightening, cutting, boxing 1 ton or more.

(c) Plus mill, size and quantity extras.

(d) Minus quant. diff.

(e) New mill classif.

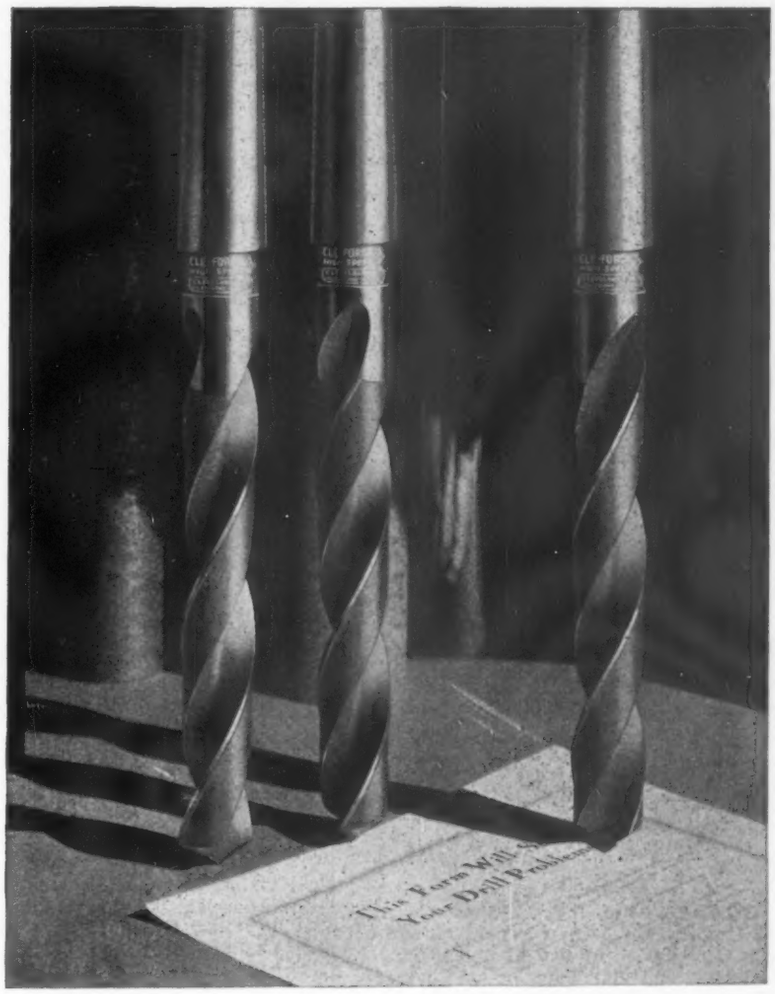
‡Domestic bars.

*Plus quan. extras.

**Less than 25 sheets.

*†50 or more bundles.

STARTLING FACTS WERE PROVEN WITH THESE FORMS



With the "Cost-per-Hole" Drill Test Form, originated by this Company, some remarkable facts concerning drill performance have been discovered. No longer can it be said in purchasing departments or shop offices that "any drill will do." Proven facts show that a Twist Drill must be selected with the same thorough care that is given to the purchase of a drill press, or any other expensive machine. • For example, an exhaustive test of five High Speed Drills made by a well-known automotive manufacturer showed that CLE-FORGE High Speed Drills averaged 29.9 points better than the average, 20.9 points better than the second best drill and 30 points better than the third best. In the final score, the record was as follows:

CLE-FORGE Drill	96.7%
Drill "C"	75.8
Drill "D"	66.7
Drill "B"	66.4
Drill "A"-3	63.4
Drill "A"-2	55.2
Drill "A"-1	41.6

Why not try the Cleveland "Cost-per-Hole" Drill Test in selecting your own Twist Drills?

Copyright 1931, The Cleveland Twist Drill Co.

Construction and Enterprise

CONCISE, TIMELY BUSINESS BUILDING OPPORTUNITIES IN FIELD OF INDUSTRY

New York

BROOKLYN—Electronic Laboratories has been incorporated with $26,000 capital to manufacture recording machines, by H. M. Rosenberg, 305 Broadway, New York.

BROOKLYN—L. & L. Electric Mfg. Corp. has been incorporated with 200 shares common stock, no par value, to manufacture electric generators, by S. Rothstein, 51 Chambers street, New York.

BUFFALO—Irving Air Chute Co., 1668 Jefferson avenue, is building a brick and stone manufacturing building to cost $40,000.

NEW YORK—Robinson Connector has been incorporated with 1000 shares no par value to manufacture automatic couplings, by Alexander, Ash & Jones, 79 Wall street.

NEW YORK—Metalcraft Originators has been incorporated with 200 shares no par value to manufacture metal stampings, by S. & M. Luloff, 274 Madison avenue.

NEW YORK—Cypress Iron Works has been incorporated with $10,000 capital to manufacture metal products, by Exco Lawyers' Albany Service, 116 Nassau street, New York.

New Jersey

CAMDEN—Knitting Machine Corp. of America has been incorporated with $125,000 capital to act as mechanical and electrical engineers, by J. Charles Winters, 311 Market street, Camden.

Pennsylvania

GROVE CITY—Heat Exchanger Co. has been incorporated with 500 shares no par value to manufacture heat exchangers and similar products, by G. T. Hileman, Grove City.

POTTSTOWN—Bell-Mattern Foundry Inc. has been incorporated with $10,000 capital to manufacture castings, forgings, patterns and similar products, by Harry F. Mattern, 556 South Nineteenth street, Reading, Pa., and associates.

SCRANTON—Scranton Pump Mfg. Co. has been incorporated with 1000 shares no par value to manufacture pumps, pumping machinery, grate bars and similar products, by William E. Watkins, Scranton, Pa.

Michigan

DETROIT—Barton Foundry & Specialty Co., 3627 Superior street, has been incorporated with $5000 capital to manufacture ferrous and nonferrous castings, by H. J. Barton, Detroit, and associates.

DETROIT—Knight Screw Products Co., 6510 Epworth building, has been incorporated with $50,000 capital to manufacture screw machine products, by William C. Knight, Birmingham, Frederic D. Hedgwood and Frederick F. Bastian, Detroit.

Illinois

CHICAGO—Parker Stove Corp., 33 North LaSalle street, has been incorporated with $250,000 capital to manufacture stoves and plumbing supplies, by Ringer, Wilhartz & Hirsch, 1501 First National Bang building.

MOLINE—McLaughlin Body Co., 2430 Third street, has been incorporated with $25,000 preferred and $10,000 common stock, to manufacture metal and wood products, by R. G. Cundy, care Moline Mfg. Co., Moline, and associates.

Southern States

WASHINGTON—Bureau of supplies and accounts, navy department, will take bids April 12 for three 4-jaw universal independent lathe chucks for delivery to the navy yard at San Diego, Calif.

BATON ROUGE, LA.—McConnell Motors Inc. has awarded a contract to A. C. Stewart for construction of a garage 50 x 200 feet, to cost $15,000.

NEW ORLEANS—Flywheel Shop has been incorporated by A. R. Thompson, 4701 Prytania street, to do a machine shop business.

Oklahoma

PICHER—Eagle Picher Lead Co. has given a contract to the Tri-State Contractors, Picher, for erection of steel for its concentration mill, to cost $300,000. (Noted Feb. 1.)

Texas

MARLIN—Marlin Ice Mfg. Co., N. Levy, manager, is in the market for compressors and refrigerating machinery for an ice plant to cost $60,000.

PELLY—C. R. Haden, 1903 Dunston road, and associates, will build a light and power plant here to cost $30,000.

Wisconsin

LITTLE CHUTE—Lakeside Bridge & Steel Co., Milwaukee, has been awarded the contract for furnishing gates and hoisting equipment for the new government dam in the Fox river here.

MILWAUKEE—United States engineer office here has placed the contract with Pittsburgh-Des Moines Steel Co., Des Moines, Iowa, for sluice gates to cost $8345.

Dominion of Canada

VANCOUVER, B. C.—Pressure Pipe Co. of Canada Ltd., Royal Bank building, has let contract to Stewart & Watson, 615 West Pender street, for the first unit of a plant at foot of Feel avenue, for the manufacture of pipe. R. W. Mitchell is engineer.

WINNIPEG, MAN.—Western Air Service Ltd. has been incorporated with $200,000 capital to manufacture airplanes, by Wilfrid Leigh Brintnell, Winnipeg.

TORONTO, ONT.—Velvet Edge Razor Products Ltd. has been incorporated with 50,000 shares no par value to manufacture razors, razor blades and allied products, by Constantine M. Nakashidze, Toronto.

WINDSOR, ONT.—Long Mfg. Co., Detroit, has obtained a plant in East Windsor and is installing machinery for the manufacture of radiators, clutches and other automotive accessories.

MONTREAL, QUE.—Lincoln Fixture Mfg. Co. of Canada Ltd. has been incorporated with $49,000 capital to manufacture electrical fixtures, by Joseph G. Magnan, Montreal.

New Trade Publications

ARC WELDERS—General Electric Co., Schenectady, N. Y., in Bulletin No. 1543 describes its gas engine-driven arc welders for use where electric power is not available.

WELDING—Manufacture of brake shoes in its welding presses is described in a current bulletin by the Thomson-Gibb Electric Welding Co., Lynn, Mass.

REFRACTORY CEMENT—E. J. Lavino & Co., Bullitt building, Philadelphia, has issued a leaflet on its ready-mixed chrome cement for use with refractories in furnaces and kilns subject to high temperatures.

MOTORS—Ohio Electric Mfg. Co., 5900 Maurice avenue, Cleveland, in Bulletin No. 211 illustrates by diagram some of the special frame designs it has developed for use with its motors for special purposes.

BELT CONVEYORS—Diamond Rubber Co. Inc., Akron, O., suggests solution of material handling problems in industrial plants, in a current booklet. Numerous applications of its belt conveyors are shown in illustrations, indicating the variety of uses to which it may be put.

TRACK CONSTRUCTION — Carnegie Steel Co., Pittsburgh, in Bulletin No. 2 describes its GEO track construction for railroad use. The device is illustrated in diagrams and halftone views of installations. It constitutes a condensed manual of rack construction.